# Portable compact disc player

# EXP521

**all versions**

Service
Service
**Service**

# Service Manual

MP3-CD PLAYBACK MP3 · ReWritable CD COMPATIBLE · COMPACT disc DIGITAL AUDIO

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**CLASS 1**
**LASER PRODUCT**


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PHILIPS

# TECHNICAL SPECIFICATION

## General

Dimensions (Wx H x D) : 137.5 x 30x 137.5mm
Weight without batteries : 220g

## Shock resistance

+X/-X direction : ≥2.5g
+Y/-Y direction : ≥2.5g
+Z/-Z direction : ≥2.0g

## Power supply modes

| SUPPLY MODE | Voltage range |
|---|---|
| | CD |
| DC-IN socket | 3.9 - 6 V |
| Primary batteries | 1.9 - 3.2V |
| Rechargable batteries | 1.9 - 3.2V |

## Battery lifetime

| BATTERY TYPE | CD ESP=off | CD ESP=on | MP3 ESP=off | MP3 ESP=on |
|---|---|---|---|---|
| Alkaline batteries (2x AA) | ≥ 10 h (14h typ.) | ≥ 6 h (8h typ.) | ≥ 24 h (28h typ.) | ≥ 7 h (10h typ.) |
| Alkaline batteries (2x AAA) | ≥ 2 h (4h typ.) | ≥ 1 h (2h typ.) | ≥ 8 h (10h typ.) | ≥ 2 h (3h typ.) |
| Rechargable batteries (AY3363) | ≥ 2 h (3h typ.) | ≥ 1 h (2h typ.) | ≥ 5 h (6h typ.) | ≥ 1 h (2h typ.) |

## Battery level detection

| DETECTION LEVEL | Primary batteries |
|---|---|
| Battery empty | 1.8V +100/-50mV |
| Difference btw.level 1 and battey empty | 0.3V ± 100mV |
| Difference btw.level 2 and battey empty | 0.6V ± 100mV |
| Difference btw.level 3 and battey empty | 0.9V ± 100mV |

## Current consumption

| OPERATION MODE | DC-IN SUPPLY (4.5V) | | | | BATT. SUPPLY (2.25V) | | | |
|---|---|---|---|---|---|---|---|---|
| | CD ESP=on | CD ESP=off | MP3 ESP=on | MP3 ESP=off | CD ESP=on | CD ESP=off | MP3 ESP=on | MP3 ESP=off |
| Play | 220mA | 220mA | 220mA | 220mA | 250mA | 250mA | 250mA | 250mA |
| Charge | 300mA | 300mA | 300mA | 300mA | n/a | n/a | n/a | n/a |
| Jump | 480mA | 480mA | 480mA | 480mA | 480mA | 480mA | 480mA | 480mA |
| Stand-by | 60mA | 60mA | 60mA | 60mA | 1mA | 1mA | 1mA | 1mA |

## Headphone out

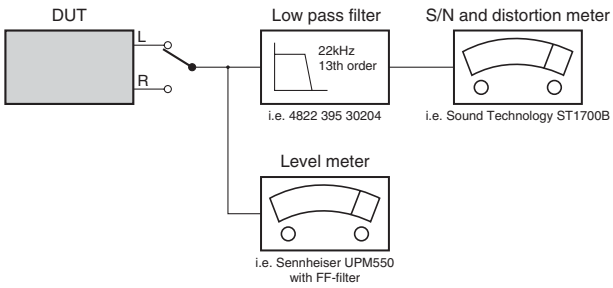
Output power (THD=10%)
/17 version only : 6mW (+1/-3dB)
all other versions : 3mW (+1/-3dB)
Frequency response (1mW) : 100Hz-20kHz within 6dB
S/N ratio CD (unwght) : ≥78dB (80dB typ.)
S/N ratio CD (unw.),incl.muting : 100dB
S/N ratio CD (A-wght) : ≥80dB (82dB typ.)
S/N ratio CD (A-wght),incl.muting : 100dB
THD+N (1kHz, 1mW) : ≤1.5% (1.0% typ.)
Crosstalk (1kHz) : ≤-24dB (-44dB typ.)
Channel unbalance (-40dB) : ≤5dB
Volume attenuation (1kHz) : >60dB

## Dynamic Bass Boost DBB

| DBB STAGE | Frequency response | | |
|---|---|---|---|
| | 63 Hz | 1k Hz | 10kHz |
| DBB 1 | +5dB ± 2dB | 0dB ± 2dB | +0dB ± 2dB |
| DBB 2 | +8dB ± 2dB | 0dB ± 2dB | +0dB ± 2dB |

## Measurement setup CD

Use Audio Signal disc SBC429 4822 397 30184




# FEATURES

| FEATURES OF CD-PORTABLE/MP3 | EXP521 (all versions) |
|---|---|
| TUNER FM / MW | - / - |
| CD-REWRITABLE COMPATIBILITY | ● |
| ELECTRONIC SKIP PROTECTION CDDA / MP3 | 168s / 420s |
| ESP DRAM SIZE | 8Mbit |
| HOLD / RESUME FUNCTION | ● / ● |
| DBB STAGES | 2 |
| ACOUSTIC FEEDBACK | - |
| PROGRAM MEMORY | 50 |
| RECHARGE FUNCTION NiCd / NiMH | - / ● |
| CORD REMOTE CONTROL PREPARED | ● |

# ACCESSORIES

| ACCESSORIES FOR CD PORTABLE -TARGET | EXP521 | | | | | |
|---|---|---|---|---|---|---|
| | /00C | /01 | /10 | /05Z | /17 | /07 |
| **AY 3160/00** AC/DC Adaptor 3140 118 31051 | X | | | | | |
| **AY 3160/02** AC/DC Adaptor 3140 118 31122 | | X | | | | |
| **AY 3160/05** AC/DC Adaptor 3140 118 30761 | | | | X | | |
| **AY 3160/10A** AC/DC Adaptor 3140 118 31171 | | | X | | | |
| **SBC HE570/77s** Stereo Headphone 9082 100 01724 | X | X | X | X | | |
| **SBC HS383/77s** Stereo Headphone 9082 100 01821 | | | | | X | X |
| **AY3778** Remote Control 3140 118 51491 | X | X | X | X | X | X |
| **AY3363** Rechargeable battery 3103 308 84721 | X | X | X | X | | |

# INSTRUCTION FOR UES

## TROUBLESHOOTING

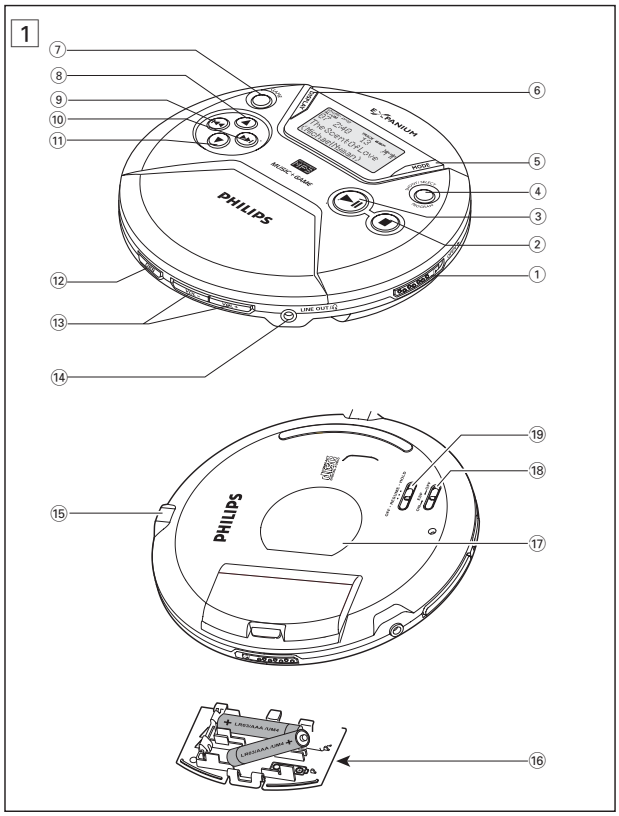
***WARNING:*** *Under no circumstances should you try to repair the set yourself as this will invalidate the warranty.*
*If a fault occurs, first check the points listed, before taking the set for repair. If you are unable to solve a problem by following these hints, consult your dealer or service center.*

**No power, playback does not start**
- Insert the batteries correctly.
- Replace the batteries.
- Connect the power adapter securely.

`Hold` **indication and/ or no reaction to controls**
- Deactivate HOLD.
- Disconnect the set from the power supply or take out the batteries for a few seconds.

**No sound or bad sound quality**
- Press ▶II to resume playback.
- Adjust the volume.
- Check and clean the connections.
- Keep this set away from active mobile phones or strong magnetic fields.

`Pls insert CD` or `No audio file` **indication**
- Insert a disc, label upwards.
- Clean or replace the disc.
- Wait until the steamed up lens has cleared.
- Make sure you have inserted an audio disc or an MP3-CD.




**Music file is not played**
- Make sure that the file names of the MP3 files end with .mp3

**Missing directories on MP3-CD**
- Make sure the total number of files and albums on your MP3-CD does not exceed 350.
- Only albums with MP3 files are shown.

**The disc skips tracks**
- Clean or replace the disc.
- Make sure ***repeat***, ***repeat album***, ***shuffle*** or ***prog*** are not selected.

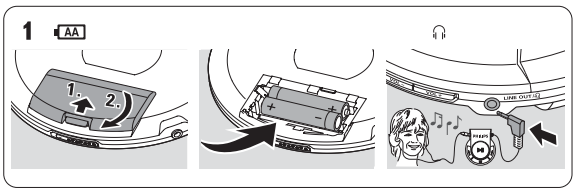
**Music skips or popping sound when playing an MP3 file**
- Play the music file on your computer. If the problem persists, encode the audio track again and make a new CD-ROM.

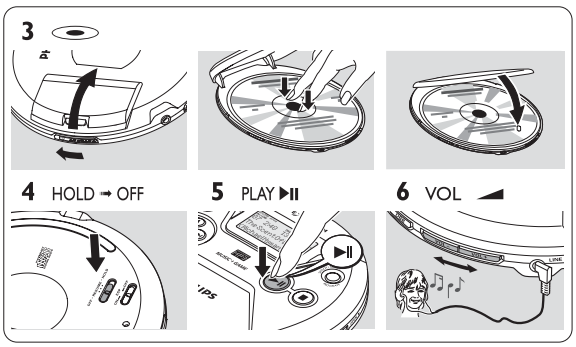
**Music is interrupted and `Oops` indication**
- Switch ESP on.

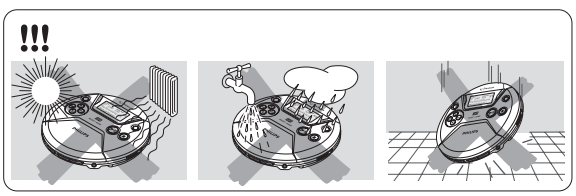
**In-car use: No power, playback does not start**
- Clean the cigarette lighter jack.
- Switch on the ignition of your car.

**In-car use: No sound or bad sound quality**
- Insert the adapter cassette correctly.
- Change the autoreverse direction of your car cassette player.
- Let the set adjust to the temperature in the car.

## QUICK START MISE EN SERVICE RAPIDE INCIO RAPIDO



# INSTRUCTION FOR USE

## English — CONTROLS

**CONTROLS (see figure 1)**

① **OPEN ▶** . . . . . opens the CD lid

② **■** . . . . . stops playback and switches the set off

③ **▶II** . . . . . switches the set on, starts playback and interrupts playback

④ **PROGRAM/ SHOOT/ SELECT** . . . MUSIC mode: programs tracks and lets you review the program
GAME mode: confirms selection of a game, setting, etc./ shoot to score

⑤ **MODE** . . . . . selects music playback options such as random order and repeat

⑥ **DISPLAY** . . . . . selects the track and album information for MP3-CDs

⑦ **GAME** . . . . . selects game mode on/ off

⑧ **▲** . . . . . MP3-CD only: selects the next album or fast skips tracks forward
GAME mode: move up

⑨ **⏮** . . . . . MUSIC mode: skips backward and searches backward
GAME mode: move left

⑩ **⏭** . . . . . MUSIC mode: skips forward and searches forward
GAME mode: move right

⑪ **▼** . . . . . MP3-CD only: selects the previous album or fast skips tracks backward
. . . . . GAME mode: move down

⑫ **DBB** . . . . . selects the bass adjustment

⑬ **VOL + / -** . . . . . adjusts the volume

⑭ **LINE OUT/🎧** . . 3.5 mm line out to connect
– the headphones
– the remote control
– this set to the audio input of your stereo equipment

⑮ **4.5V DC** . . . . . to connect the external power supply

⑯ AAA battery door

⑰ type plate

⑱ **ESP** . . . . . **E**lectronic **S**kip **P**rotection prevents music interruptions caused by shocks

⑲ **OFF•** . . . . . OFF switches RESUME and HOLD off
**RESUME•** RESUME stores the last position played
**HOLD** HOLD locks all buttons

**Supplied Accessories:**
1 x headphones, HE570 or HS383
2 x rechargeable batteries, AY3363
1 x remote control, AY3778
1 x headphone jack adapter *(for some versions only)*
1 x AC/ DC adapter, AY3160 *(supplied or optionally available)*

***CAUTION***
***Use of controls or adjustments or performance of procedures other than herein may result in hazardous radiation exposure or other unsafe operation.***

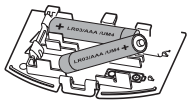
## BATTERIES

***(supplied or optionally available)***

You can use the following batteries with this CD-player:

- alkaline batteries type **AAA (LR03, UM4)** or **AA (LR6, UM3)** preferably Philips).

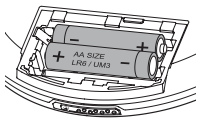
*Notes:*
– *Old and new or different types of batteries should not be combined.*
– *Remove batteries if they are empty or if the player is not going to be used for a long time.*



**AAA (LR03, UM4)**

**Inserting AAA (LR03, UM4) or AY3363 batteries**

**1** Open the **AAA** battery door.
**2** Insert **AAA** batteries as shown onto the back of the door.
**3** Replace the battery-loaded **AAA** door back onto the set.



**AA (LR6, UM3)**

**Inserting AA (LR6, UM3) batteries**

To increase playback time, insert **AA** batteries into the battery compartment and use the **AA** marked battery door.

- Open the battery compartment and insert either 2 normal or alkaline batteries.

**Indication of empty batteries**

- Replace the batteries or connect the power adapter as soon as ▭ blinks and `Replace batteries`.

Remove batteries if they are empty or if the set will not be used for a long time.

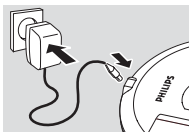
***Batteries contain chemical substances,so they should be disposed of properly.***

## POWER ADAPTER

***(supplied or optionally available)***

Use only the AY3160 adapter (4.5V/ 400mA direct current, positive pole to the center pin). Any other product may damage the player.

**1** Make sure the local voltage corresponds to the power adapter's voltage.
**2** Connect the power adapter to the 4.5V DC jack of the player and to the wall outlet.




*Note: Always disconnect the adapter when you are not using it.*

## ENVIRONMENTAL INFORMATION

- All redundant packing material has been omitted. We have done our utmost to make the packaging easily separable into two materials: cardboard (box) and polyethylene (bags, protective foam sheet).
- Your set consists of materials which can be recycled if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packing materials, dead batteries and old equipment.

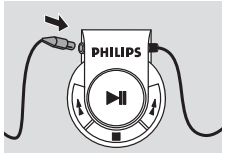
***This set complies with the radio interference requirements of the European Community.***

# INSTRUCTION FOR USE

## REMOTE CONTROL AY3778

***(supplied or optionally available)***

Use the AY3778 cord remote control. The buttons on the remote control have the same functions as the corresponding buttons on the set.



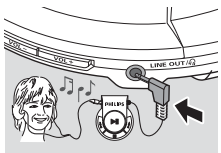

**1** Press ■ twice to switch off the set.

**2** Firmly connect the remote control to LINE OUT/ 🎧 on the set.

**3** Adjust the volume on the CD player and remote control.

## HEADPHONES

- Connect the supplied headphones to the LINEOUT/ 🎧 jack of the player.




*Note:*
– *LINE OUT/🎧 can also be used for connecting this set to your HiFi system.To adjust the sound and volume, use the controls on the connected audio equipment and on the CD player.*

**IMPORTANT!**

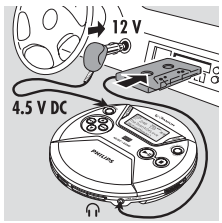
**Hearing safety:** listen at a moderate volume. using headphones at high volume can impair your hearing.

**Traffic safety:** do not use headphones while driving or cycling as you may cause an accident.

## IN-CAR USE ACCESSORIES

***(connections supplied or optionally available)***

Only use the AY3545 or AY3548 car voltage converter (4.5V DC, positive pole to the center pin) and the AY3501 car cassette adapter. Any other product may damage the set.




**1** Put the set on a horizontal, vibration-free and stable surface. Make sure it is in a safe place, where the set is neither a danger nor an obstacle to the driver and the passengers.

**2** Plug the voltage converter into the cigarette lighter jack ***(only for 12V car battery, negative grounding)***, then connect the wired end with 4.5V DC input jack on the set.

**3** If necessary, clean the cigarette lighter jack to obtain a good electrical contact.

**4** Turn down the volume and connect the cassette adapter plug to LINE OUT/ 🎧 on the set.

**5** Carefully insert the cassette adapter into the car radio's cassette compartment.

**6** Make sure the cord does not hinder your driving.

**7** Decrease the volume on the set if necessary. Start playback on the set and adjust the sound with the car radio controls.

- ***Always remove the voltage converter from the cigarette lighter jack when the set is not in use.***

*Note:*
– *If your car radio has a LINE IN jack, it is better to use it for the car radio connection instead of the cassette adapter. Connect the signal lead to this LINE IN jack and to LINE OUT/🎧 on the set.*

## MP3 MUSIC FILES

The music compression technology MP3 (MPEG Audio Layer 3) reduces the digital data of an audio CD significantly while maintaining CD-like sound quality. With MP3 you can record up to 10 hours of CD-like music on a single CD-ROM.

### How to get music files

Either download legal music files from the internet to your computer hard disc or create them from your own audio CDs. For this, insert an audio CD into your computer´s CD-ROM drive and convert the music using an appropriate encoder software. To achieve a good sound quality, a bit rate of 128 kbps or higher is recommended for MP3 music files.

### How to organize music files

In order to easily handle the large number of music files on a CD-ROM, you can organize them in folders ("albums").
The tracks of an album will be played in alphabetical order. If you want to arrange them in a certain order, let the file names start with numbers.
For example:
**001**-ONEWORLD.MP3
**002**-FIRESTARTER.MP3
**003**-DEEP.MP3
The albums will be arranged in alphabetical order. If albums are located in an album, they will be played after this album. Albums without MP3 files will be skipped.
If there are MP3 files which you did not put into an album, you will find them in the album number 01. Various is the first album that will be played.

### How to make a CD-ROM with MP3 files

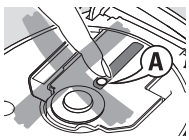
Use your computer´s CD burner to record ("burn") the music files from your hard disc on a CD-ROM. Use either ISO 9660 disc format or UDF. Some CD burner software like e.g. "DirectCD" support the UDF format. Make sure that the file names of the MP3 files end with .mp3.

### Supported formats

This set supports:
– Disc format: ISO 9660, Joliet, Multisession, UDF, Enhanced Music CD, Mixed Mode CD
– MP3 bit rate: 32–320 kbps and variable bit rate
– Total number of music files and albums: around 350 (with a typical file name length of 64 characters)

*Notes:*
– *All trademarks used are owned by their respective owners.*

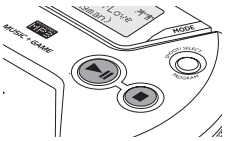
## CD PLAYER AND CD HANDLING




- Do not touch the lens Ⓐ of the CD player.
- Do not expose the unit, batteries or CDs to humidity, rain, sand or excessive heat (caused by heating equipment or direct sunlight).
- You can clean the CD player with a soft, slightly dampened, lint-free cloth. Do not use any cleaning agents as they may have a corrosive effect.
- To clean the CD, wipe it in a straight line from the center toward the edge using a soft, lint-free cloth. A cleaning agent may damage the disc! Never write on a CD or attach a sticker to it.
- The lens may cloud over when the unit is moved suddenly from cold to warm surroundings. Playing a CD is not possible then. Leave the CD player in a warm environment until the moisture has evaporated.
- Active mobile phones in the vicinity of the CD player may cause malfunctions.
- Avoid dropping the unit as this may cause damage.

# INSTRUCTION FOR USE

## PLAYING A DISC

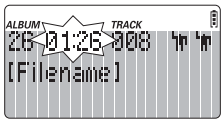


With this set you can play
– all pre-recorded audio CDs
– all finalized audio CDRs and CDRWs
– MP3-CDs (CD-ROMs with MP3 files)

**1** Push the OPEN▶ slider to open the CD lid.

**2** Insert a disc, printed side up, by pressing gently on the disc´s center so that it fits onto the hub. Close the lid by pressing it down.

**3** Press ▶II to start playback.
eXpanium and LOADING are displayed briefly. Playback starts. The track type (CD or MP3), the current track number and the elapsed playing time are displayed. For an MP3 track, the album number is also displayed and the filename is scrolled one time.




- Press ▶II to interrupt playback.
  Elapsed playback time flashes and the dancing animation freezes.
- To resume playback press ▶II again.

**4** Press ■ to stop playback.
The total number of tracks, the track types (CD, MP3), the number of albums on an MP3-CD and the total playing time (of an audio disc only) are displayed.

**5** To remove the disc, hold it by its edge and press the hub gently while lifting the disc.

**6** Press ■ again to switch off the played.

*Notes:*
– *After pressing ▶II it may take some time until the first MP3 track is played.*
– *The display clears automatically after 20 seconds if no controls are operated in the stop mode.*

## SELECTING AND SEARCHING ON CDs

### Selecting a track during playback

- Briefly press ⏮ or ⏭ once or several times to skip to the current, previous or next track.
  Playback continues with the selected track, and the track's number is displayed.

### Searching for a passage during playback

**1** Keep ⏮ or ⏭ pressed to find a particular passage in a backward or forward direction.
Searching starts while playback continues at low volume. After 2 seconds the search speeds up.

**2** Release the button when you reach the desired passage.
Playback continues from this position.

*Note:*
– *In **shuffle**, or **repeat** modes searching is only possible within the particular track.*

### Selecting on MP3-CDs
### Selecting an album during playback

- Briefly press ▼ or ▲ once or several times to skip to the first track of the current, previous or subsequent album.
  The first track of the selected album is played.

### Selecting a track during playback

**1** Keep ▼ or ▲ pressed to skip quickly to previous or subsequent MP3 tracks.
Skipping starts and speeds up after 5 seconds.

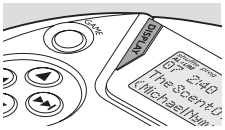
**2** Release the button at the desired track.
Playback continues with the selected track.

*Note:*
– *To skip from track to track at low speed, use ⏮ or ⏭.*

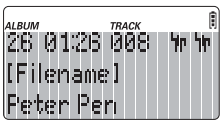
## DISPLAY INFORMATION

***(for MP3 tracks only)***

**1** Press DISPLAY repeatedly during playback to select the information to be displayed:
– Filename: the track´s file name,
– Album: the album´s folder name,
– Artist: the artist´s name (if this ID3 tag information is available),
– Title: the track´s title (if this ID3 tag information is available),
– the track type.



**2** The selected information is scrolled once. The album number and track number are displayed.

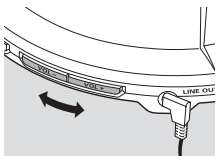



*Note:*
– *The ID3 tag is part of an MP3 file and contains various track information such as the track´s title or the artist´s name. Complete the ID3 tag information with your MP3 encoder software before burning the MP3-CD.*

## VOLUME AND SOUND

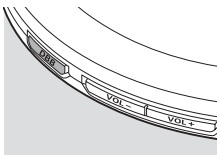
### Volume adjustment

- Adjust the volume by using VOL +/–.



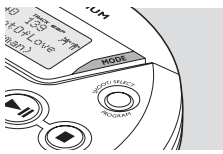
### DBB
### Bass adjustment

**1** Press DBB once or more to select the bass enhancement options:
DBB 1 moderate bass enhancement is activated.
DBB 2 strong bass enhancement is activated.

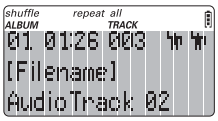


**2** Press DBB again to switch off the bass enhancement options.
DBB 1 or DBB 2 disappears.

## SELECTING DIFFERENT PLAYING POSSIBILITIES-MODE



**1** Press MODE during playback as often as required in order to activate one of the following.
– ***shuffle all:*** All tracks of the disc are played in random order once.
– ***shuffle repeat all:*** All tracks of the disc are played repeatedly in random order.
– ***repeat:*** The current track is played repeatedly.
– ***repeat all:*** The entire disc is played repeatedly.
– ***shuffle album*** (with MP3-CDs only):
All tracks of the current album are played in random order once.
– ***shuffle repeat album*** (with MP3-CDs only):
All tracks of the current album are played repeatedly in random order.
– ***repeat album*** (with MP3-CDs only):
All tracks of the current album are played repeatedly.

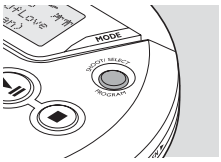



**2** Playback starts in the chosen mode after 2 seconds.

- To return to normal playback, press MODE repeatedly until the display shows no active modes.

# INSTRUTION FOR USE

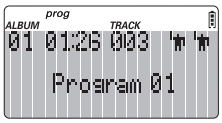
## PROGRAMMING TRACK NUMBERS




You can store up to 50 tracks to play in a program. A single track may be stored more than once in the program.

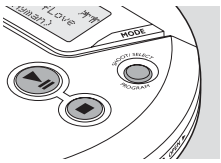
**1** While playback is stopped, select a track with ⏮ or ⏭.

**2** Press PROGRAM/SHOOT/SELECT to store the track.
 ***prog*** and the number of stored tracks are displayed.




**3** Select and store all desired tracks in this way.

**4** Press ▶II to start playback of your selected tracks.
 ***prog*** is shown and playback starts.




- You can review the program by pressing PROGRAM/SHOOT/SELECT for more than 3 seconds.
 The display shows all the stored tracks in sequence.

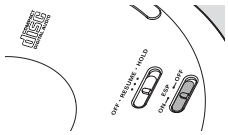
*Note:*
– *If you try to store more than 50 tracks, FULL is displayed.*

### Clearing the program

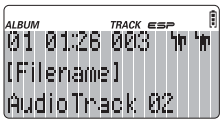
- While playback is stopped, press ■ to clear program.
 Program Clear is displayed once, ***prog*** goes off, and the program is cleared.

*Note:*
– *The program will also be cleared if the power supply is interrupted, or if the CD-player lid is opened, or if the set switches off automatically.*

## ESP/ POWER SAVE MODE

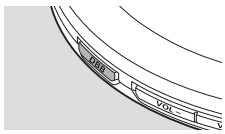



With a conventional portable CD-player you might have experienced that the music stopped e.g. when you were jogging. The **E**LECTRONIC **S**KIP **P**ROTECTION prevents loss of sound caused by light vibrations and shocks. Continuous playback is ensured. However ESP does not prevent playback interruptions during vigorous running. It also **does not protect the unit against any damage caused by dropping!**



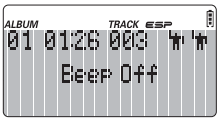

- Adjust the ESP slider to ON/OFF position to select the following:
 – ESP is shown and ESP is switched on.
 – ESP disappears. Powersaving are switched on for CD Audio tracks to achieve the highest sound quality.

## BEEP



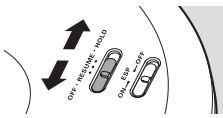

A beep confirms that you have pressed a button or that the batteries are empty.

- During music mode only keep DBB pressed for 2 seconds to switch beep either on or off:
 Beep On is displayed: Beep is switched on.
 Beep Off is displayed: Beep is switched off.



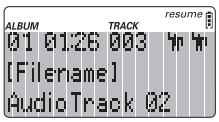

## RESUME AND HOLD

### Storing the last position played – RESUME




You can store the last position played. When restarting, playback will continue from where you have stopped.

**1** Switch the slider to RESUME during playback to activate RESUME.
 **resume** is shown.



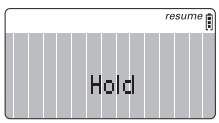

**2** Press ■ whenever you want to stop playback.

**3** Press ▶II whenever you want to resume playback.
 **resume** shown and playback continues from where you have stopped.

- To deactivate RESUME, switch the slider to OFF.
 **resume** goes off.

### HOLD – locking all buttons

You can lock all buttons of the set. When you press any key, no action will be executed then.



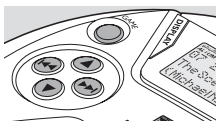

**1** Switch the slider to HOLD to activate HOLD.
 **resume** is shown and Hold is displayed. All buttons are locked.
 When pressing any key, Hold is displayed.

**2** To deactivate HOLD, switch the slider to OFF.
 **resume** resume disappears.

## MUSIC AND GAMES

You can listen to music and play games at the same time. Select from 5 games: SNATCHER, MATCHER, COPTER, BREAKER and MUNCHER.

### To start a game




**1** If necessary, press ▶II to switch on the set.

**2** Press GAME.
 Display shows the games main menu. The current game is highlighted.

**3** Press ▲ or ▼ to scroll through the list of games.

**4** To confirm your game selection, press PROGRAM/ SHOOT/ SELECT.

**5** Press ▲ or ▼ to scroll through the game submenu.
 Display shows **Start, Level, Speed, Top Score.**

**6** Press PROGRAM/ SHOOT/ SELECT to confirm and start play.

### How to control your game

Use the buttons on the set to navigate:

***Up*** ▲ ***Left*** ⏮ ***Down*** ▼ ***Right*** ⏭

- Press PROGRAM/ SHOOT/ SELECT to SHOOT/ confirm an action.

### End game

To quit the game function you can:

- Press GAME once or more until the display returns to the music mode display.
- Press ■.

*Note:*
– *This unit automatically switches off the beep signal when you select the game mode during music playback. The beep signal automatically returns when you quit GAME. For more details on the beep signal, please read the* ***BEEP*** *chapter.*

# SAFETY & WARNINGS

## ESD

**(GB) WARNING**
All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wristband with resistance. Keep components and tools at this potential.

**(NL) WAARSCHUWING**
Alle IC´s en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen vermindern. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

**(F) ATTENTION**
Tous les IC et beaucoup d´autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévite pourrait être considérablement écourtée par le fait qu´aucune précaution nést prise à leur manipulation.
Lors de réparations, s´assurer de bien être relié au même potentiel que la masse de l´appareil et enfileer le bracelet serti d´une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l´on utilise soient également à ce potentiel.

**(D) WARNUNG**
Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.
Sorgen Sie dafür, daß Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

**(I) AVVERTIMENTO**
Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione. Durante le riparationi occorre quindi essere collegato allo stesso potenziale che quello della massa delápparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

**(GB) AVAILABLE ESD PROTECTION EQUIPMENT :**

| | | |
|---|---|---|
| **anti-static table mat** | large 1200x650x1.25mm | 4822 466 10953 |
| | small 600x650x1.25mm | 4822 466 10958 |
| **anti-static wristband** | | 4822 395 10223 |
| **connection box** (3 press stud connections, 1MΩ) | | 4822 320 11307 |
| **extendible cable** (2m, 2MΩ, to connect wristband to connection box) | | 4822 320 11305 |
| **connecting cable** (3m, 2MΩ, to connect table mat to connection box) | | 4822 320 11306 |
| **earth cable** (1MΩ, to connect any product to mat or to connection box) | | 4822 320 11308 |
| **KIT ESD3** (combining all 6 prior products - small table mat) | | 4822 310 10671 |
| **wristband tester** | | 4822 344 13999 |

## SAFETY

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.
Safety components are marked by the symbol ⚠

(F)
Les normes de sécurité exigent que l`appareil soit remis à l`état d`origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.
Les composants de sécurité sont marqués ⚠

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Originalersatzteile zu verwenden.
Sicherheitsbauteile sind durch das Symbol ⚠ markiert.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.
De Veiligheidsonderdelen zijn aangeduid met het symbool ⚠

(I)
Le norme di sicurezza estigono che l´apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambiago identici a quelli specificati.
Componenty di sicurezza sono marcati con ⚠

(GB) **DANGER**: Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

**CLASS 1**
**LASER PRODUCT**

**(S) Varning !**
Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

**(DK) Advarsel !**
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

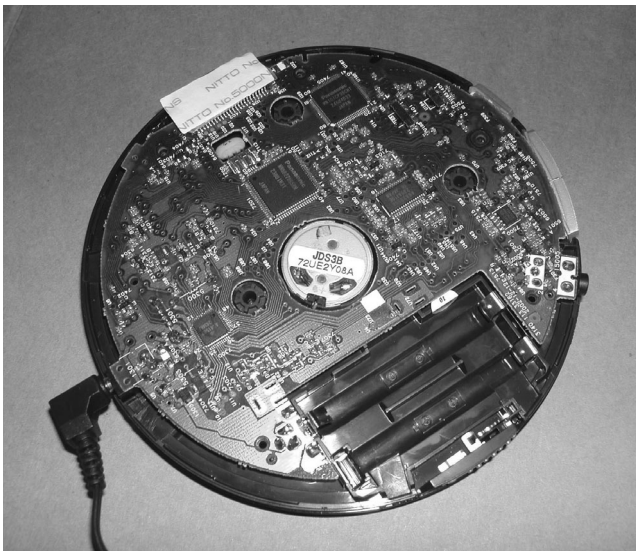
**(FIN) Varoitus !**
Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen !

(GB)
After servicing and before returning the set to customer perform a leakage current measurement test from all exposed metal parts to earth ground, to assure no shock hazard exists.
The leakage current must not exceed 0.5mA.

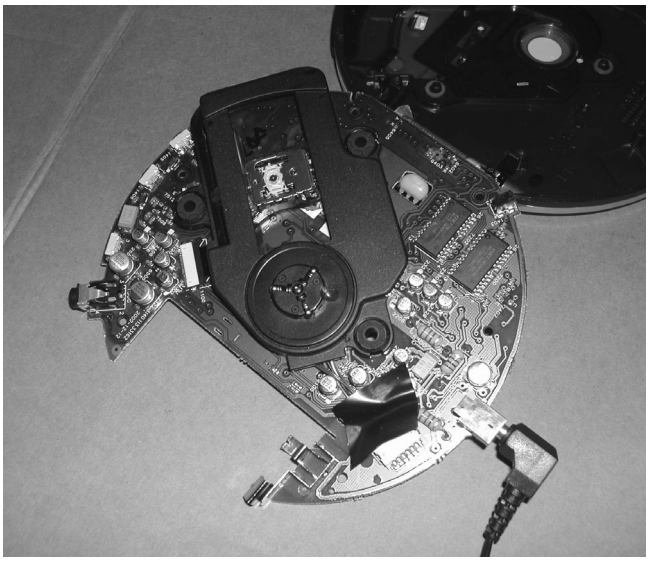
(F)
"Pour votre sécurite, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

## SERVICE HINTS

REPAIR POSITION COPPERSIDE



REPAIR POSITION COMPONENTSIDE



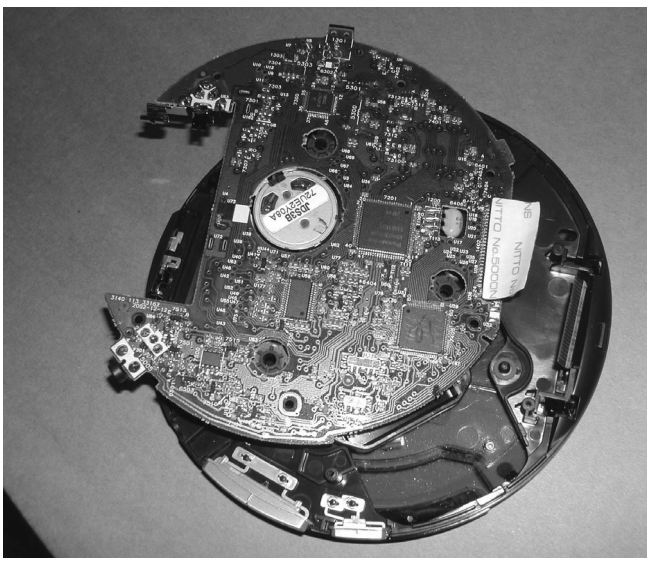
### To get access to the copperside of the printed board assembly proceed as follows:

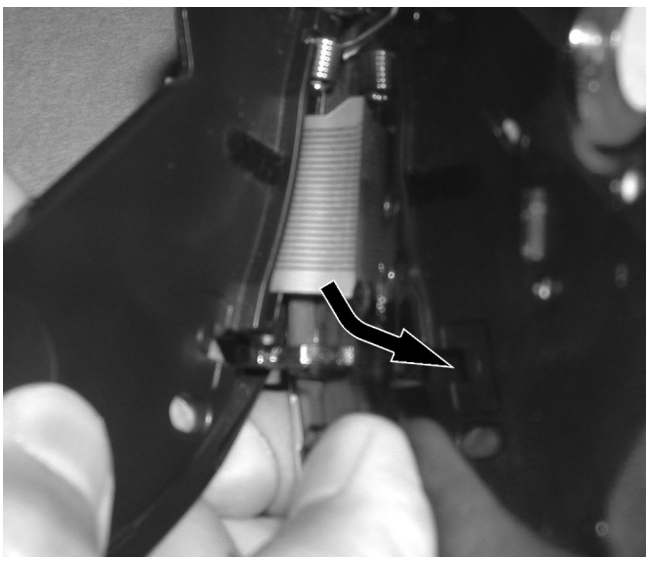
1.Remove the bottom (3x) screws (2x of them under the rubber-foot) and the up (2x) screws (in the CD-door)
2.Lift the bottom -cabinet
3.Supply the unit via external DC-socket
4.Take care that the door switch is closed during measurements

### To get access to the componentside of the printed board assembly proceed as followed:

1.Remove the bottom (3x) screws (2x of them under the rubber-foot) and the up (2x) screws (in the CD-door)
2.Open the CD-door
3.Lift the top-cabinet and put it backwards on the table
4.Supply the unit via the external DC-socket
5.Take care that the door switch is closed during measurements

### DISMANTLING THE CD-DOOR





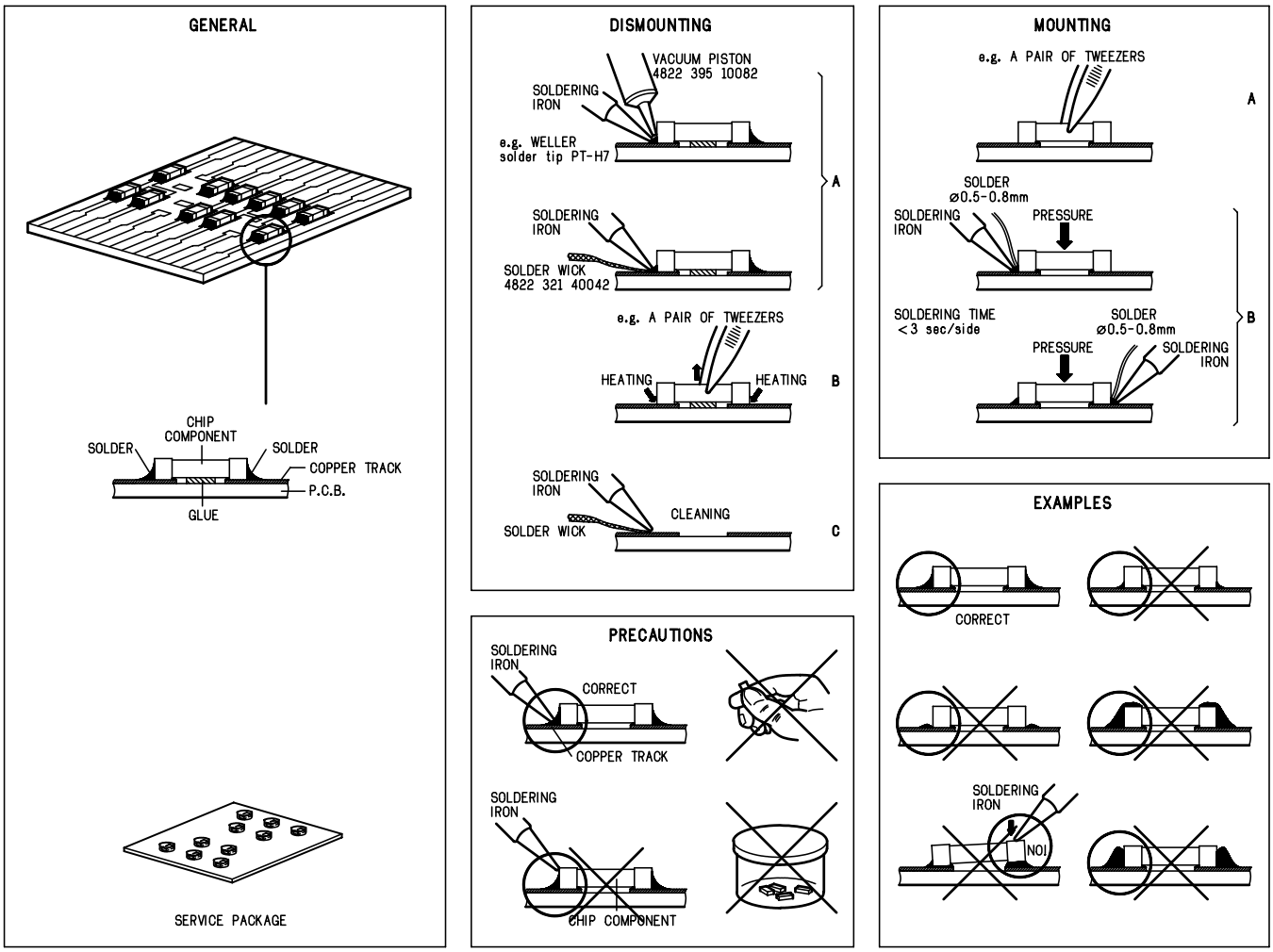
### To dismantle the CD-door proceed as follows:

1.Dismantle bottom and printed board/drive assembly
2.Disconnect the sticker
(flex-foil connector on the membrance keyboard)
3.Disconnect membrance keyboard
(flex-foil connector on copperside of printed board)

4.Bend the cabinet rightwards downwards as indicated in the picture above

Remark:Do not use screwdrivers or tools .
Sharp edges could damage hinge or cabinet part.

## HANDLING CHIP COMPONENTS



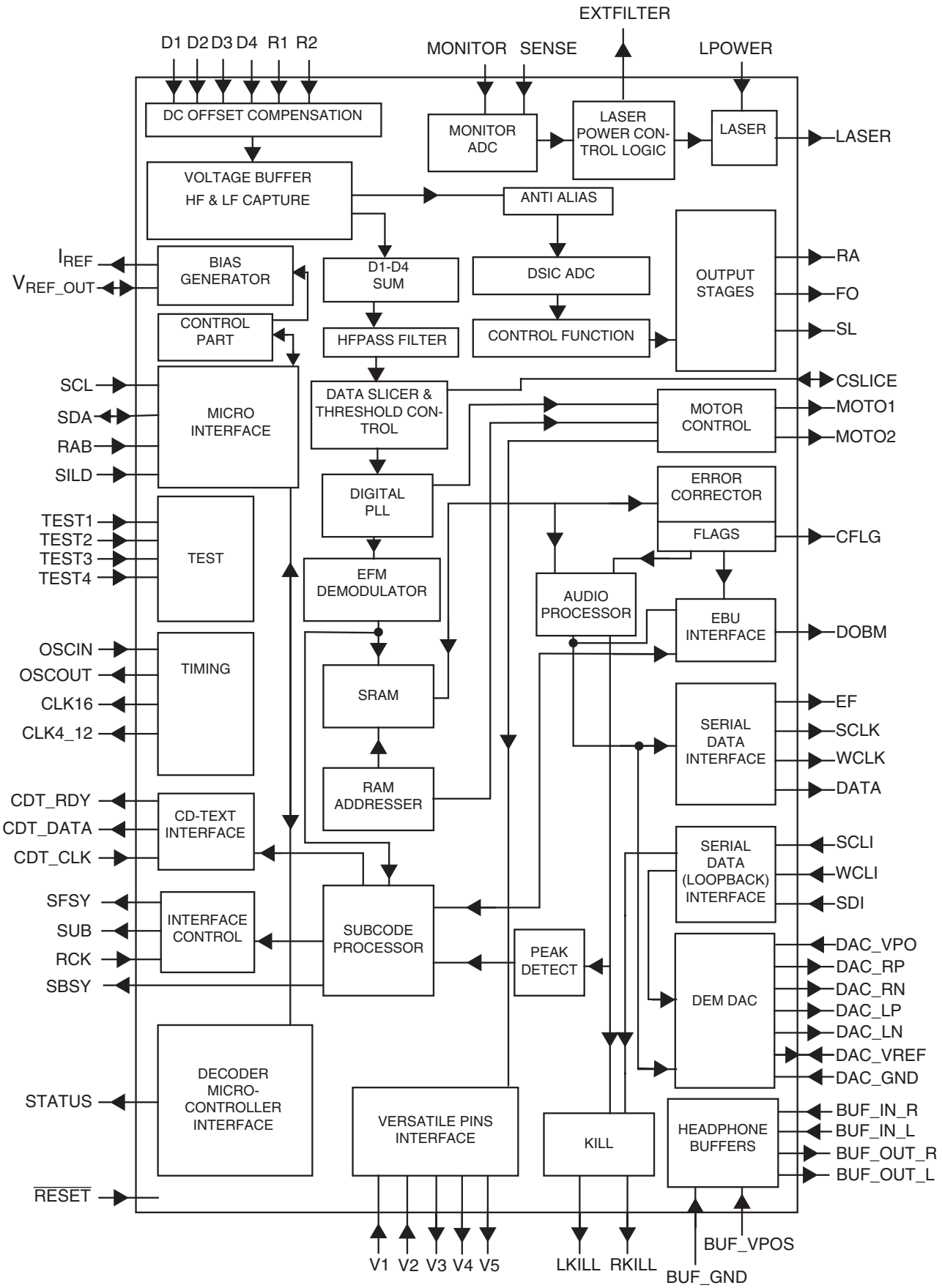

## SERVICE TOOLS

| | |
|---|---|
| **Audio signal disc SBC429** | 4822 397 30184 |
| **Playability test disc SBC444** | 4822 397 30245 |
| **Test disc 5** (disc without errors ) + **Test disc 5A**(disc with dropout errors black spots and fingerprints) **SBC426/ SBC426A** | 4822 397 30096 |

## ESD PROTECTION EQUIPMENT

| | |
|---|---|
| **Anti-static table mat** large 1200x650x1.25mm | 4822 466 10953 |
| small 600x650x1.25mm | 4822 466 10958 |
| **Anti-static wristband** | 4822 395 10223 |
| **Connection box** (3press stud connections,1MΩ) | 4822 320 11307 |
| **Extendible cable** (2m,2MΩ ,to connect wristband to connection box) | 4822 320 11305 |
| **Connecting cable** (3m,2MΩ ,to connect table mat to connection box) | 4822 320 11306 |
| **Earth cable** (1MΩ , to connect any product to mat or to connection box) | 4822 320 11308 |
| **KIT ESD3**(combining all 6 prior products - small table mat) | 4822 310 10671 |
| **Wristband tester** | 4822 344 13999 |

## BLOCK DIAGRAM OF IC SAA7824HL



# PIN DESCRIPTIONS OF IC SAA7824HL

| SYMBOL | PIN | DESCRIPTION |
|---|---|---|
| LPOWER | 1 | Laser power supply |
| EXTFILTER | 2 | 10 nF capacitor for Laser start-up control |
| MONITOR | 3 | Laser monitor diode |
| SENSE | 4 | OPU ground reference point for MONITOR measurement |
| $V_{SSA1}$ | 5 | Analogue ground 1 |
| IREF | 6 | Reference current pin (24KΩ resister to analogue ground) |
| $V_{DDA1}$ | 7 | Analogue supply voltage 1 |
| VREF_OUT | 8 | Servo reference voltage |
| D1 | 9 | Diode voltage/current input (central diode signal input) |
| D2 | 10 | Diode voltage/current input (central diode signal input) |
| D3 | 11 | Diode voltage/current input (central diode signal input) |
| D4 | 12 | Diode voltage/current input (central diode signal input) |
| R1 | 13 | Diode voltage/current input (satellite diode signal input) |
| R2 | 14 | Diode voltage/current input (satellite diode signal input) |
| CSLICE | 15 | 10nF capacitor for adaptive HF dataslicer |
| $V_{DDA2}$ | 16 | Analogue supply voltage 2 |
| $V_{SSA2}$ | 17 | Analogue ground 2 |
| OSCOUT | 18 | Crystal/resonator output |
| OSCIN | 19 | Crystal/resonator input |
| $V_{SSA3}$ | 20 | Analogue ground 3 |
| DAC_GND | 21 | Audio DAC ground |
| DAC_RP | 22 | Audio DAC right channel differential output (positive) |
| DAC_RN | 23 | Audio DAC right channel differential output (negative) |
| DAC_VREF | 24 | Audio DAC decoupling point (10uF//100nF to ground) |
| DAC_LN | 25 | Audio DAC left channel differential output (negative) |
| DAC_LP | 26 | Audio DAC left channel differential output (positive) |
| DAC_VPOS | 27 | Audio DAC positive supply |
| BUF_VPOS | 28 | Audio buffer positive supply |
| BUF_IN_R | 29 | Audio buffer right input |
| BUF_OUT_R | 30 | Audio buffer right output |
| BUF_OUT_L | 31 | Audio buffer left output |
| BUF_IN_L | 32 | Audio buffer left input |
| BUF_GND | 33 | Audio buffer ground |
| LKILL | 34 | Kill output for left channel (configurable as open drain) |
| RKILL | 35 | Kill output for right channel (configurable as open drain) |
| CDT_RDY | 36 | CD-Text to micro ready flag |
| CDT_DATA | 37 | CD-Text data to micro |
| CDT_CLK | 38 | CD-Text micro clock |
| CFLAG | 39 | Correction flag output (open drain) |
| $V_{SSD1}$ | 40 | Digital ground 1 |
| $V_{DDD1}$ | 41 | Digital supply voltage 1 |
| SDI | 42 | Serial data input (loopback) |
| WCLI | 43 | Word clock input (loopback) |

| SYMBOL | PIN | DESCRIPTION |
|---|---|---|
| SCLI | 44 | Serial bit clock (loopback) |
| EF | 45 | C2 error flag |
| DATA | 46 | Serial data output |
| WCLK | 47 | Word clock output |
| SCLK | 48 | Serial clock output |
| CLK16 | 49 | 16MHz clock |
| CLK4_12 | 50 | Configurable 4MHz or 12MHz clock |
| $\overline{RESET}$ | 51 | Power on reset (active low) |
| SDA | 52 | Micro interface data I/O line (open drain output) |
| SCL | 53 | Micro interface clock line |
| RAB | 54 | Micro interface R/W & load control line (4-wire) |
| SILD | 55 | Micro interface R/W & load control line (4-wire) |
| STATUS | 56 | Servo interrupt request line/decoder status register/DC offset value readback |
| RCK | 57 | Subcode clock |
| SUB | 58 | P to W subcode |
| SFSY | 59 | Subcode frame sync |
| SBSY | 60 | Subcode block sync |
| $V_{SSD2}$ | 61 | Digital ground 2 |
| DOBM | 62 | Bi-phase mark output (externally buffered) |
| $V_{DDD2}$ | 63 | Digital supply voltage 2 |
| RA | 64 | Radial actuator |
| FO | 65 | Focus actuator |
| SL | 66 | Sledge actuator |
| MOTO1 | 67 | Motor output 1 |
| MOTO2 | 68 | Motor output 2 |
| $V_{SSD3}$ | 69 | Digital ground 3 |
| $V_{DDD3}$ | 70 | Digital supply voltage 3 |
| V1 | 71 | Versatile pin 1 |
| V2 | 72 | Versatile pin 2 |
| V3 | 73 | Versatile pin 3 |
| V4 | 74 | Versatile pin 4 |
| V5 | 75 | Versatile pin 5 |
| TEST1 | 76 | Test pin |
| TEST2 | 77 | Test pin |
| TEST3 | 78 | Test pin |
| TEST4 | 79 | Test pin |
| LASER | 80 | Laser drive |

# PIN DESCRIPTIONS OF IC SAA7752

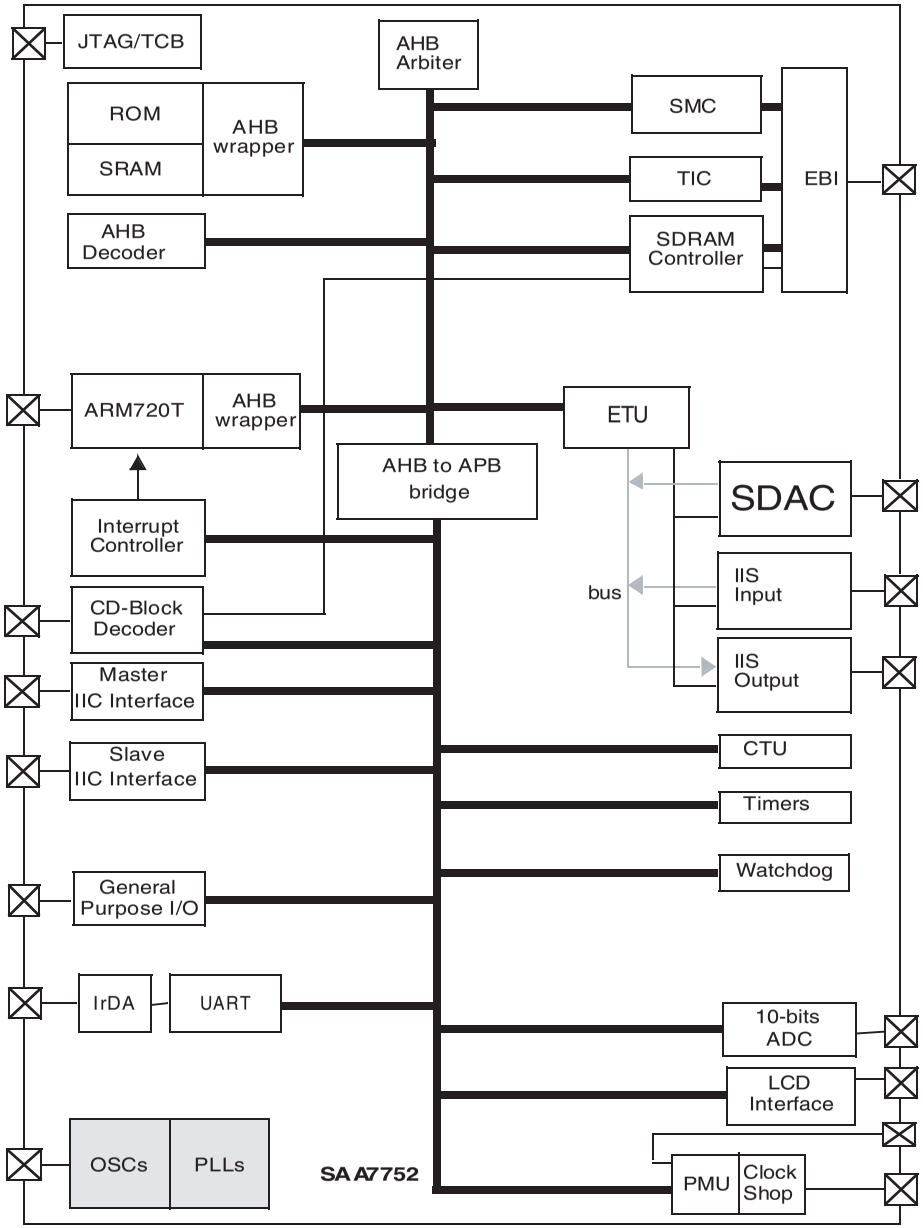



**Table 1** Pin list SAA7752EL

| SYMBOL[1] | LFBGA 208 PIN | DIGITAL I/O LEVEL | APPL FUNC | PIN STATE AFTER RESET | DESCRIPTION |
|---|---|---|---|---|---|
| **General Purpose Pins (fixed: 25 pins)** | | | | | |
| GPIO<24> | A11 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<23> | B11 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<22> | A10 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<21> | B10 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<20> | A9 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<19> | B9 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<18> | A8 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<17> | B8 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<16> | A7 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<15> | F4 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<14> | G2 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<13> | F3 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<12> | G1 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<11> | F2 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<10> | F1 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<9> | D3 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<8> | E2 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<7> | D4 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<6> | E1 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<5> | D2 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<4> | D1 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<3> | C2 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<2> | C1 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<1> | B1 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| GPIO<0> | A1 | 0- 3.3VDC tolerant | I/O | 0 | General Purpose IO pin |
| **8.4672 MHz oscillator (fixed: 5 pins)** | | | | | |
| XTAL1I | P4 | | A | | 6MHz clock input |
| XTAL1O | R3 | | A | | 6MHz clock output |
| CD_CLOCK | K1 | 0- 3.3VDC tolerant | O | | CD clock output (gated) |
| VDDA1 | R2 | | | | Analog supply Oscillator1 |
| VSSA1 | R1 | | | | Analog ground Oscillator 1 |
| **Voltage Supply PLLs (fixed: 2 pins)** | | | | | |
| VDDA3 | N2 | | | | Analog supply PLLs |
| VSSA3 | N1 | | | | Analog ground PLLs |
| PLL (fixed 1pin) | | | | | |
| CLKO1 | F15 | 0- 3.3VDC tolerant | O | | 256fs audio output clock |
| **LCD Interface (fixed: 13 pins)** | | | | | |
| LCD_WE | K3 | | O | | Write Enable |
| LCD_RW_WR | A16 | | O | | 6800 read/write select<br>8080 active 'high' write enable |

# PIN DESCRIPTIONS OF IC SAA7752

| SYMBOL(1) | LFBGA 208 PIN | DIGITAL I/O LEVEL | APPL FUNC | PIN STATE AFTER RESET | DESCRIPTION |
|---|---|---|---|---|---|
| LCD_E_RD | B15 | | O | | 6800 active 'low' enable<br>8080 active 'high' write enable |
| LCD_DB<0> | D14 | 0- 3.3VDC tolerant | I/O | | Data input 0/Data output 0 |
| LCD_DB<1> | B17 | 0- 3.3VDC tolerant | I/O | | Data input 1/Data output 1 |
| LCD_DB<2> | C14 | 0- 3.3VDC tolerant | I/O | | Data input 2/Data output 2 |
| LCD_DB<3> | C16 | 0- 3.3VDC tolerant | I/O | | Data input 3/Data output 3 |
| LCD_DB<4> | D13 | 0- 3.3VDC tolerant | I/O | | Data input 4/Data output 4 |
| LCD_DB<5> | A17 | 0- 3.3VDC tolerant | I/O | | Data input 5/Data output 5/serial clock |
| LCD_DB<6> | C13 | 0- 3.3VDC tolerant | I/O | | Data input 6/Data output 6/Serial data input |
| LCD_DB<7> | B16 | 0- 3.3VDC tolerant | I/O | | Data input 7/Data output 7/Serial data output |
| LCD_CSB | C12 | | O | | Chip Select (active low) |
| LCD_RS | D12 | | O | | 'high' Data register select<br>'low' Instruction register select |
| **10-bit ADC (fixed: 9 pins)** | | | | | |
| GPA<4> | A5 | | A | | Analog General Purpose pin 4 |
| GPA<3> | B5 | | A | | Analog General Purpose pin3 |
| GPA<2> | J3 | | A | | Analog General Purpose pin2 |
| GPA<1> | M4 | A | | | Analog General Purpose pin 1 |
| GPA<0> | N3 | | A | | Analog General Purpose pin 0 |
| VREFP<1> | M3 | | A | | 10-bit ADC Reference voltage 1 |
| VREFP<0> | L2 | | A | | 10-bit ADC Reference voltage 0 |
| VDDA4 | M2 | A | | | nalog supply 10-bit ADC |
| VSSA4 | M1 | | | | Analog ground 10-bit ADC |
| **IIS input (fixed: 3 pins)** | | | | | |
| BCKI1 | J15 | 0- 3.3VDC tolerant | I | | Bitclock input (external) |
| WSI1 | H15 | 0- 3.3VDC tolerant | I | | Wordselect input(external) |
| DATAI1 | G15 | 0- 3.3VDC tolerant | I | | Serial data input(external) |
| **IIS output (fixed: 3 pins)** | | | | | |
| BCKO1 | M14 | | I/O | Tri-state | Bitclock output (external) |
| WSO1 | F16 | | O | Tri-state | Wordselect output(external) |
| DATAO1 | E16 | | O | Output/Low | Serial data output(external) |
| **JTAG (fixed: 5 pins)** | | | | | |
| JTAG_NTRST | K15 | 0- 3.3VDC tolerant | I | | JTAG Reset Input |
| JTAG_TCK | U12 | 0- 3.3VDC tolerant | I | | JTAG Clock Input |
| JTAG_TMS | K16 | 0- 3.3VDC tolerant | I | | JTAG Mode Select Input |
| JTAG_TDI | T13 | 0- 3.3VDC tolerant | I | | JTAG Data Input |
| JTAG_TDO | U13 | | O | | JTAG Data Output |
| **IIC slave Interface (fixed: 3 pins)** | | | | | |
| SCL_SLAVE | P12 | 0- 3.3VDC tolerant | I/O | | Serial clock IIC Slave |
| SDA_SLAVE | R12 | 0- 3.3VDC tolerant | I/O | | Serial data IIC Slave |
| A0_SLAVE | T12 | 0- 3.3VDC tolerant | I | | Address selection Slave |
| **IIC master interface (fixed: 2 pins)** | | | | | |
| SDA_MASTER | R13 | 0- 3.3VDC tolerant | I/O | | IIC data I/O line (open drain output)/<br>UART Serial Data Input |
| SCL_MASTER | P13 | 0- 3.3VDC tolerant | I/O | | IIC clock line output/<br>UART Serial Data Output |
| **CDB lock Decoder (fixed: 10 pins)** | | | | | |
| CDB_CRQ_NERDY | C5 | 0- 3.3VDC tolerant | I | | Communication request line/CD engine is ready to receive the next frame |

| SYMBOL(1) | LFBGA 208 PIN | DIGITAL I/O LEVEL | APPL FUNC | PIN STATE AFTER RESET | DESCRIPTION |
|---|---|---|---|---|---|
| CDB_NCRST_NHRDY | D5 | | O | | CD engine reset line/Host is ready to receive the next frame |
| CDB_CLAB | C9 | 0- 3.3VDC tolerant | I | | IIS/EIAJ input bit clock |
| CDB_DAAB | C7 | 0- 3.3VDC tolerant | I | | IIS/EIAJ serial data |
| CDB_WSAB | C8 | 0- 3.3VDC tolerant | I | | IIS/EIAJ word clock |
| CDB_EFAB | D9 | 0- 3.3VDC tolerant | I | | IIS/EIAJ error flags |
| CDB_V4_SUB | D8 | 0- 3.3VDC tolerant | I | | Versatile pin 4:single wire subcode/EIAJ subcode data bits |
| CDB_CFLAG_SBSY | D6 | 0- 3.3VDC tolerant | I | | Absolute time sync/EIAJ subcode block sync |
| CDB_SFSY | D7 | 0- 3.3VDC tolerant | I | | EIAJ subcode frame sync |
| CDB_RCK | C6 | | O | | EIAJ subcode clock output |
| Audio DAC (SDAC, fixed 5 pins) | | | | | |
| DAC_VREFP | R17 | | | | analog positive reference for SDAC |
| DAC_REFN | P16 | | | | analog negative reference for SDAC |
| VOUTL | P15 | | A | | Analog left LINE output |
| VOUTR | R16 | | A | | Analog right LINE output |
| DAC_VDD | N14 | | I | | Supply digital part of the SDAC |
| **EBI (fixed: 49 pins)** | | | | | |
| EBI_NCS<2> | G16 | | O | | Chip Selected 2 |
| EBI_NCS<1> | T10 | | O | | Chip Selected 1 |
| EBI_NCS<0> | U10 | | O | | Chip Selected 0 |
| EBI_SDNCS<0> | H3 | | O | | External SDRAM selection1 and SDRAM selection0 |
| EBI_WEN | J2 | | O | | Write enable not (for SDRAM only) |
| EBI_A<20> | J16 | | I/O | | EBI address |
| EBI_A<19> | H16 | | I/O | | EBI address |
| EBI_A<18> | F14 | | O | | EBI address |
| EBI_A<17> | G14 | | O | | EBI address |
| EBI_A<16> | H14 | | O | | EBI address |
| EBI_A<15> | J14 | | O | | EBI address |
| EBI_A<14> | R9 | O | | | EBI address |
| EBI_A<13> | T9 | O | | | EBI address |
| EBI_A<12> | U9 | O | | | EBI address |
| EBI_A<11> | R8 | O | | | EBI address |
| EBI_A<10> | T8 | O | | | EBI address |
| EBI_A<9> | U8 | | O | | EBI address |
| EBI_A<8> | P11 | | O | | EBI address |
| EBI_A<7> | R7 | | O | | EBI address |
| EBI_A<6> | P10 | | O | | EBI address |
| EBI_A<5> | U7 | | O | | EBI address |
| EBI_A<4> | P9 | | O | | EBI address |
| EBI_A<3> | T7 | | O | | EBI address |
| EBI_A<2> | P8 | | O | | EBI address |
| EBI_A<1> | R6 | | O | | EBI address |
| EBI_A<0> | U6 | | O | | EBI address |
| EBI_D<15> | T6 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<14> | U5 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<13> | T5 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<12> | U4 | 0- 3.3VDC tolerant | I/O | | EBI data |

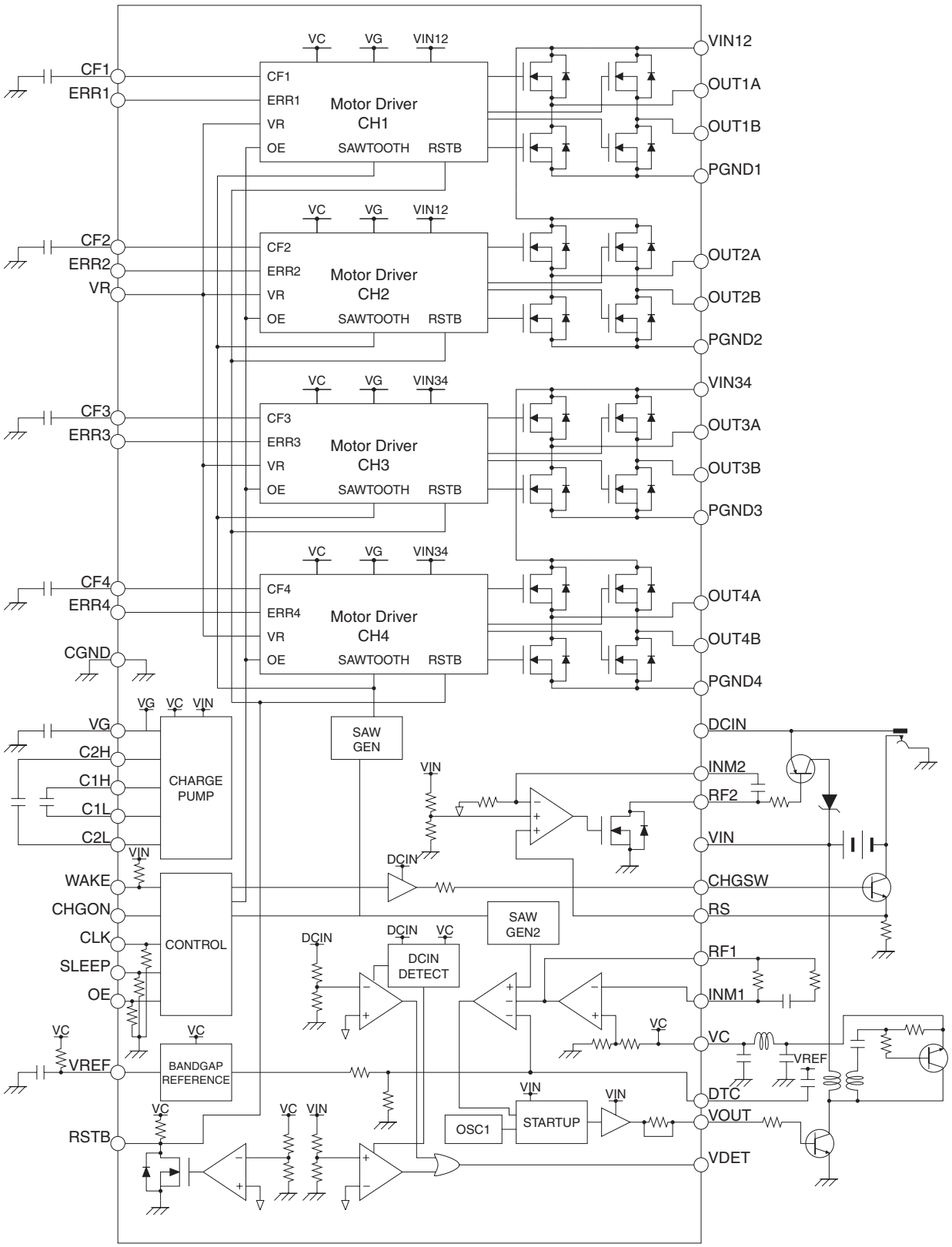
# PIN DESCRIPTIONS OF IC SAA7752

| SYMBOL[1] | LFBGA 208 PIN | DIGITAL I/O LEVEL | APPL FUNC | PIN STATE AFTER RESET | DESCRIPTION |
|---|---|---|---|---|---|
| EBI_D<11> | T4 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<10> | U3 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<9> | T3 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<8> | P7 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<7> | U2 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<6> | P6 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<5> | U1 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<4> | R5 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<3> | T2 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<2> | P5 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<1> | T1 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_D<0> | R4 | 0- 3.3VDC tolerant | I/O | | EBI data |
| EBI_SDCLKOUT | J1 | | O | | SDRAM clock |
| EBI_CKE<0> | H4 | | O | | SDRAM clock enable |
| EBI_DQM<1> | T11 | | O | | SDRAM data mask 1 |
| EBI_DQM<0> | U11 | | O | | SDRAM data mask 0 |
| EBI_NRAS | R10 | | O | | SDRAM: row address strobe<br>SMC: byteWr0 (byte write enable for byte 0... active LOW) |
| EBI_NCAS | R11 | | O | | SDRAM column address strobe<br>SMC: byteWr1 (byte write enable for byte 1... active LOW) |
| EBI_NOE | H2 | | O | | EBI output enable |
| **UART (fixed: 3 pins)** | | | | | |
| UART_DIR_TX | D10 | | O | | |
| UART_REQ_RX | C10 | 0- 3.3VDC tolerant | I | | |
| UART_CLK | D11 | 0- 3.3VDC tolerant | I/O | | |
| **Mode Selection pins SAA7752 (fixed: 3 pins)** | | | | | |
| MODE<2> | L16 | 0- 3.3VDC tolerant | I | | |
| MODE<1> | M15 | 0- 3.3VDC tolerant | I | | |
| MODE<0> | M16 | 0- 3.3VDC tolerant | I | | |
| **Wake-up input pin SAA7752 (fixed: 1 pin)** | | | | | |
| WAKE_UP | L1 | 0- 3.3VDC tolerant | I | | Wake up input pin |
| **Reset input pin SAA7752 (fixed: 1 pin)** | | | | | |
| NRESET_IN | L15 | 0- 3.3VDC tolerant | I | | System Reset Input |
| **Reset output pin SAA7752 (fixed: 1 pin)** | | | | | |
| RESET_OUT | N16 | | O | | Reset output |
| **Digital supplies SAA7752 (fixed: 6 pins)** | | | | | |
| VDDI1 | L4 | | | | Core supply SAA7752 |
| VSSIS1 | L3 | | | | Core ground and substrate SAA7752 |
| VDDI2 | G4 | | | | Core supply SAA7752 |
| VSSI2 | G3 | | | | Core ground SAA7752 |
| VDDI3 | E4 | | | | Core supply SAA7752 |
| VSSI3 | E3 | | | | Core ground SAA7752 |
| **Peripheral supplies SAA7752 (fixed: 4 pins)** | | | | | |
| VDDE3V3 | J4 | | | | Peripheral (I/O) supply SAA7752 (3.3V) |
| VSSE3V3 | K4 | | | | Peripheral (I/O) ground SAA7752 |
| VDDE_EBI | E17 | | | | Peripheral (I/O) supply SAA7752 for EBI pads |
| VDDE_EBI | K14 | | | | Peripheral (I/O) supply SAA7752 for EBI pads |
| VSSE_EBI | F17 | | | | Peripheral (I/O) ground SAA7752 for EBI pads |
| VSSE_EBI | L14 | | | | Peripheral (I/O) ground SAA7752 for EBI pads |
| **Not connected pins (fixed: 2 pins)** | | | | | |
| NC | D15 | | | | Not connected |
| NC | A4 | | | | Not connected |
| NC | B2 | | | | Not connected |
| NC | A2 | | | | Not connected |
| NC | D17 | | | | Not connected |
| NC | D16 | | | | Not connected |
| NC | C15 | | | | Not connected |
| NC | C17 | | | | Not connected |
| NC | N4 | | | | Not connected |
| NC | P3 | | | | Not connected |
| NC | P2 | | | | Not connected |
| NC | P1 | | | | Not connected |
| NC | A6 | | | | Not connected |
| NC | B6 | | | | Not connected |
| NC | K2 | | | | Not connected |
| NC | E15 | | | | Not connected |
| NC | B3 | | | | Not connected |
| NC | A3 | | | | Not connected |
| NC | B4 | | | | Not connected |
| NC | B14 | | | | Not connected |
| NC | A15 | | | | Not connected |
| NC | B13 | | | | Not connected |
| NC | A14 | | | | Not connected |
| NC | E14 | | | | Not connected |
| NC | T17 | | | | Not connected |
| NC | U17 | | | | Not connected |
| NC | T16 | | | | Not connected |
| NC | R15 | | | | Not connected |
| NC | U16 | | | | Not connected |
| NC | M17 | | | | Not connected |
| NC | K17 | | | | Not connected |
| NC | H17 | | | | Not connected |
| NC | G17 | | | | Not connected |
| NC | J17 | | | | Not connected |
| NC | L17 | | | | Not connected |
| NC | N17 | | | | Not connected |
| NC | P14 | | | | Not connected |
| NC | R14 | | | | Not connected |
| NC | U15 | | | | Not connected |
| NC | T15 | | | | Not connected |
| NC | T14 | | | | Not connected |
| NC | N15 | | | | Not connected |
| NC | U14 | | | | Not connected |
| NC | C4 | | | | Not connected |

## PIN DESCRIPTIONS OF IC SAA7752

| SYMBOL[1] | LFBGA 208 PIN | DIGITAL I/O LEVEL | APPL FUNC | PIN STATE AFTER RESET | DESCRIPTION |
|---|---|---|---|---|---|
| NC | C3 | | | | Not connected |
| NC | H1 | | | | Not connected |
| NC | A13 | | | | Not connected |
| NC | A12 | | | | Not connected |
| NC | B12 | | | | Not connected |

## BLOCK DIAGRAM OF IC SC111259A



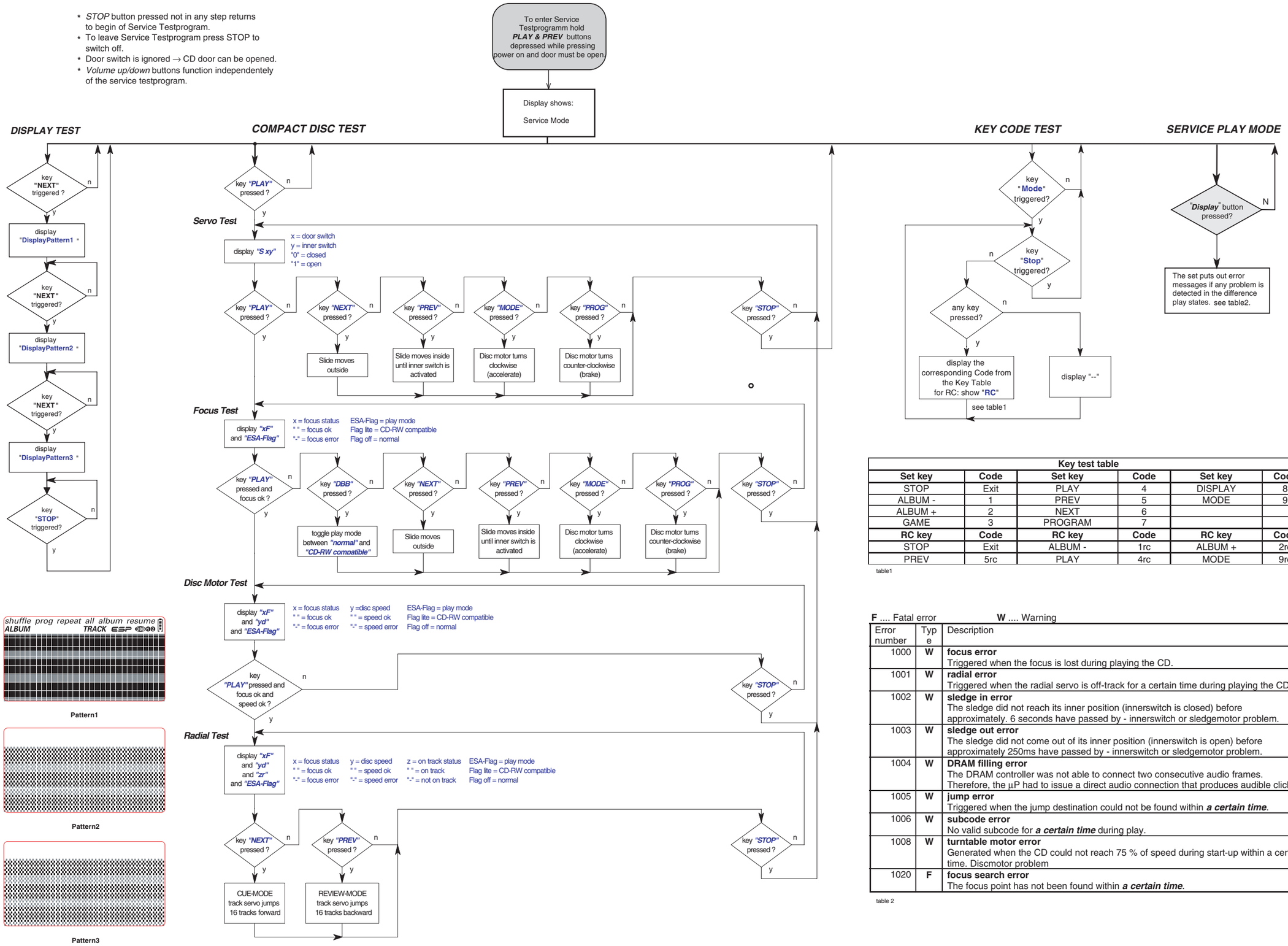
## PIN DESCRIPTIONS OF IC SC111259A

| Pin# | Symbol | Pin Description |
|---|---|---|
| 1 | SLEEP | Sleep input |
| 2 | WAKE | Wake input |
| 3 | VR | Reference Voltage Input(Motor driver) |
| 4 | ERR4 | Control signal input(CH4) |
| 5 | CF4 | Phase correction capacitor connect (CH4) |
| 6 | CF3 | Phase correction capacitor connect (CH3) |
| 7 | ERR3 | Control signal input(CH3) |
| 8 | ERR2 | Control signal input(CH2) |
| 9 | CF2 | Phase correction capacitor connect (CH2) |
| 10 | CF1 | Phase correction capacitor connect (CH1) |
| 11 | ERR1 | Control signal input(CH1) |
| 12 | OUT1A | Positive drive output(CH1) |
| 13 | GND | H-bridge driver ground |
| 14 | OUT1B | Negative drive output(CH2) |
| 15 | VIN12 | H-bridge driver voltage supply(CH1,CH2) |
| 16 | OUT2B | Negative drive output(CH2) |
| 17 | GND | H-bridge driver ground |
| 18 | OUT2A | Positive drive output(CH2) |
| 19 | OUT3A | Positive drive output(CH3) |
| 20 | GND | H-bridge driver ground |
| 21 | OUT3B | Negative drive output(CH3) |
| 22 | VIN34 | H-bridge driver voltage supply(CH3,CH4) |
| 23 | OUT4B | Negative drive output(CH4) |
| 24 | GND | H-bridge driver ground |
| 25 | OUT4A | Positive drive output(CH4) |
| 26 | VG | Charge pump output |
| 27 | C2H | Charge pump capactitor connect |
| 28 | C1H | Charge pump capactitor connect |
| 29 | C1L | Charge pump capactitor connect |
| 30 | C2L | Charge pump capactitor connect |
| 31 | VIN | Battery voltage supply |
| 32 | RSTB | Reset block output |
| 33 | CHGSW | Transistor drive output for battery charger |
| 34 | RS | OP-Amp non-inverting input for battery charger |
| 35 | INM2 | Error amplifier inverting input for battery charger |
| 36 | RF2 | Error amplifier output for battery charger |
| 37 | DCIN | DC power supply from AC adaptor |
| 38 | VDET | DCIN over voltage and VIN low voltage detect putput |
| 39 | VREF | Voltage reference circuit output |
| 40 | DTC | Max duty control voltage input for power management |
| 41 | VOUT | PWM output for power managenent |
| 42 | VC | Power management power supply |
| 43 | CGND | Internal ground |
| 44 | RF1 | OP-Amp output for power management |
| 45 | INM1 | OP-Amp inverting input for power management |
| 46 | CLK | Clock input |
| 47 | OE | Output enable for motor driver |
| 48 | CHGON | Charge enable for battery charger |

3 - 8

# SERVICE TEST PROGRAM - FLOW CHART

- *STOP* button pressed not in any step returns to begin of Service Testprogram.
- To leave Service Testprogram press STOP to switch off.
- Door switch is ignored → CD door can be opened.
- *Volume up/down* buttons function independently of the service testprogram.




| Key test table | | | | | |
|---|---|---|---|---|---|
| **Set key** | **Code** | **Set key** | **Code** | **Set key** | **Code** |
| STOP | Exit | PLAY | 4 | DISPLAY | 8 |
| ALBUM - | 1 | PREV | 5 | MODE | 9 |
| ALBUM + | 2 | NEXT | 6 | | |
| GAME | 3 | PROGRAM | 7 | | |
| **RC key** | **Code** | **RC key** | **Code** | **RC key** | **Code** |
| STOP | Exit | ALBUM - | 1rc | ALBUM + | 2rc |
| PREV | 5rc | PLAY | 4rc | MODE | 9rc |

table1

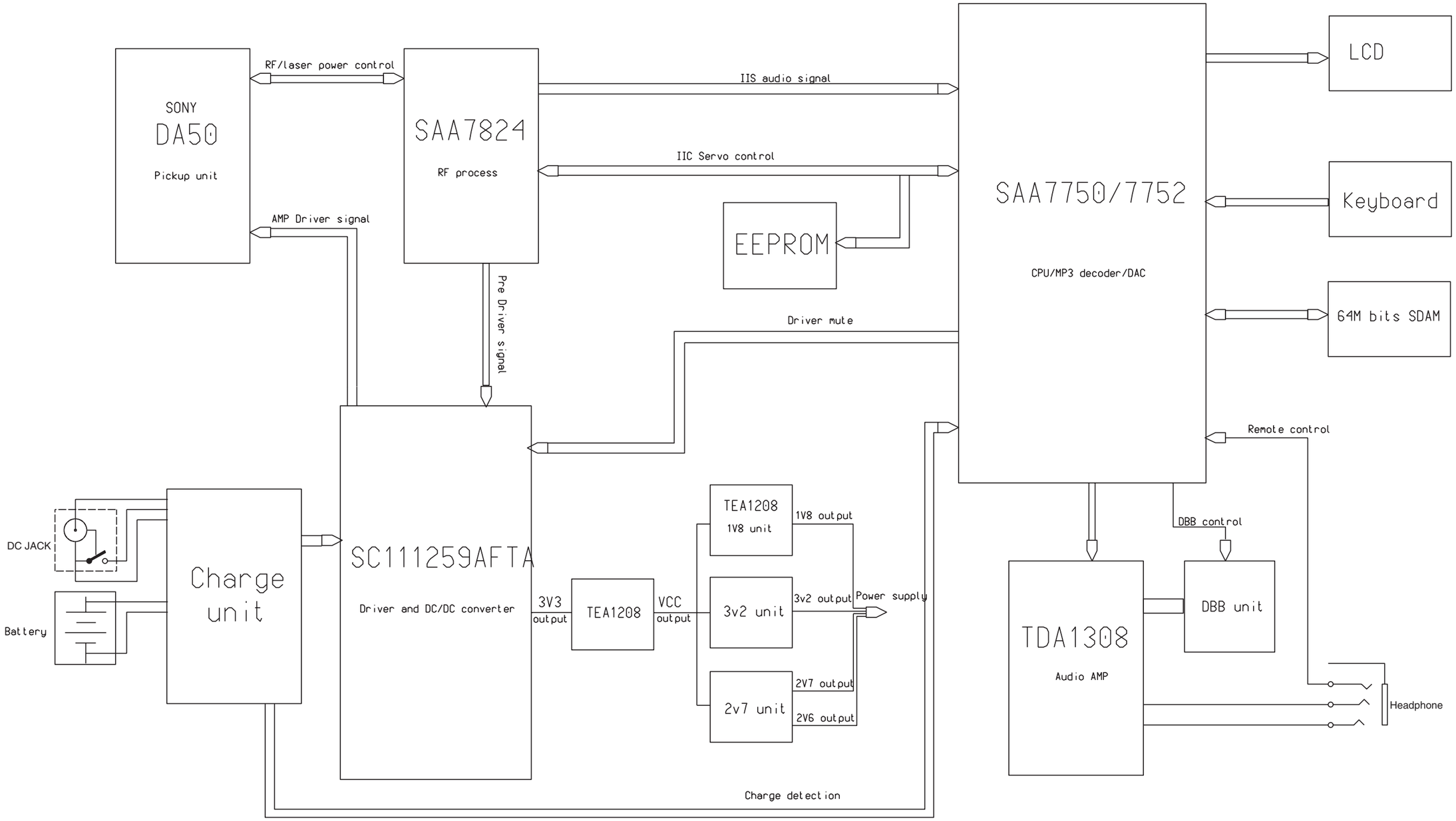
**F** .... Fatal error **W** .... Warning

| Error number | Type | Description |
|---|---|---|
| 1000 | **W** | **focus error**<br>Triggered when the focus is lost during playing the CD. |
| 1001 | **W** | **radial error**<br>Triggered when the radial servo is off-track for a certain time during playing the CD. |
| 1002 | **W** | **sledge in error**<br>The sledge did not reach its inner position (innerswitch is closed) before approximately. 6 seconds have passed by - innerswitch or sledgemotor problem. |
| 1003 | **W** | **sledge out error**<br>The sledge did not come out of its inner position (innerswitch is open) before approximately 250ms have passed by - innerswitch or sledgemotor problem. |
| 1004 | **W** | **DRAM filling error**<br>The DRAM controller was not able to connect two consecutive audio frames. Therefore, the µP had to issue a direct audio connection that produces audible clicks. |
| 1005 | **W** | **jump error**<br>Triggered when the jump destination could not be found within ***a certain time***. |
| 1006 | **W** | **subcode error**<br>No valid subcode for ***a certain time*** during play. |
| 1008 | **W** | **turntable motor error**<br>Generated when the CD could not reach 75 % of speed during start-up within a certain time. Discmotor problem |
| 1020 | **F** | **focus search error**<br>The focus point has not been found within ***a certain time***. |

table 2

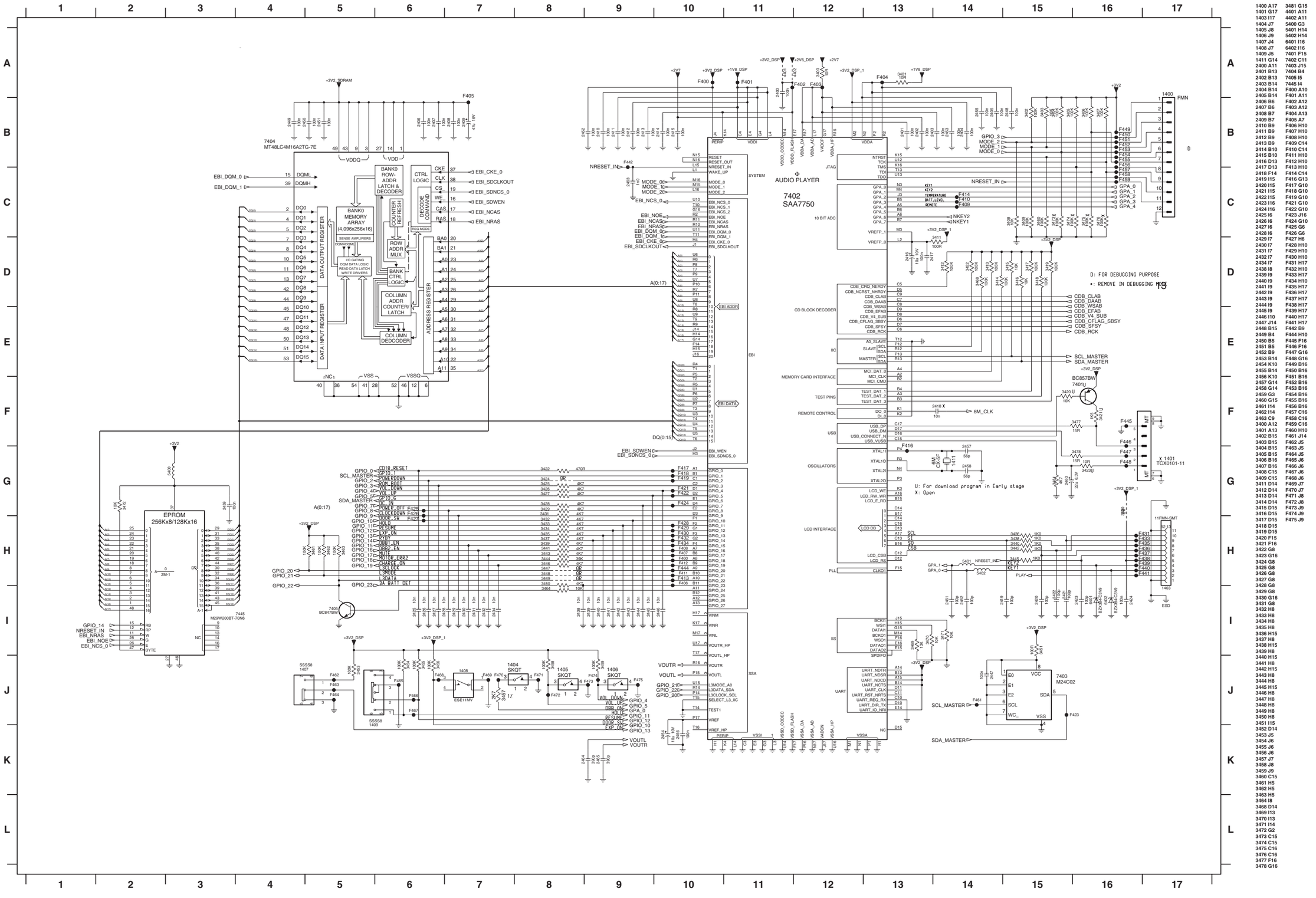
3 - 9

## BLOCKDIAGRAM



4 -1

# COMBI BOARD - CIRCUIT DIAGRAM
# CONTROL/ESP PART

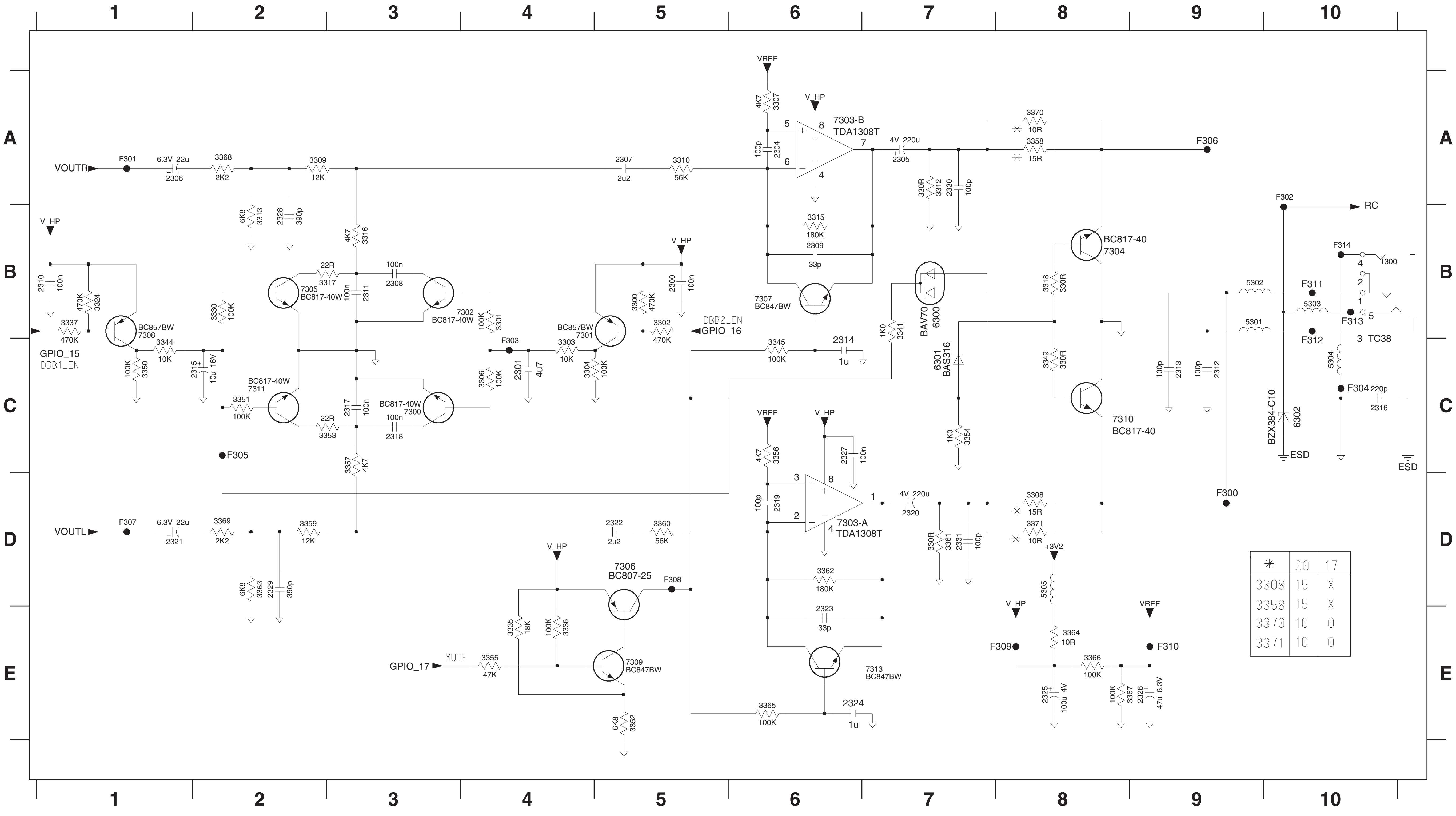



| | |
|---|---|
| 1400 A17 | 3481 G15 |
| 1401 G17 | 4401 A11 |
| 1403 I17 | 4402 A11 |
| 1404 J7 | 5400 G3 |
| 1405 J8 | 5401 H14 |
| 1406 J9 | 5402 H14 |
| 1407 J4 | 6401 I16 |
| 1408 J7 | 6402 I16 |
| 1409 J5 | 7401 F15 |
| 1411 G14 | 7402 C11 |
| 2400 A11 | 7403 J15 |
| 2401 B13 | 7404 B4 |
| 2402 B13 | 7405 I5 |
| 2403 B14 | 7445 I4 |
| 2404 B14 | F400 A10 |
| 2405 B14 | F401 A11 |
| 2406 B6 | F402 A12 |
| 2407 B6 | F403 A12 |
| 2408 B7 | F404 A13 |
| 2409 B7 | F405 A7 |
| 2410 B9 | F406 H10 |
| 2411 B9 | F407 H10 |
| 2412 B9 | F408 H10 |
| 2413 B9 | F409 C14 |
| 2414 B10 | F410 C14 |
| 2415 B10 | F411 H10 |
| 2416 D13 | F412 H10 |
| 2417 D13 | F413 H10 |
| 2418 F14 | F414 C14 |
| 2419 I15 | F416 G13 |
| 2420 I15 | F417 G10 |
| 2421 I15 | F418 G10 |
| 2422 I15 | F419 G10 |
| 2423 I16 | F421 G10 |
| 2424 I16 | F422 G10 |
| 2425 I6 | F423 J16 |
| 2426 I6 | F424 G10 |
| 2427 I6 | F425 G6 |
| 2428 I6 | F426 G6 |
| 2429 I7 | F427 H6 |
| 2430 I7 | F428 H10 |
| 2431 I7 | F429 H10 |
| 2432 I7 | F430 H10 |
| 2434 I7 | F431 H17 |
| 2438 I8 | F432 H10 |
| 2439 I9 | F433 H17 |
| 2440 I9 | F434 H10 |
| 2441 I9 | F435 H17 |
| 2442 I9 | F436 H17 |
| 2443 I9 | F437 H17 |
| 2444 I9 | F438 H17 |
| 2445 I9 | F439 H17 |
| 2446 I10 | F440 H17 |
| 2447 J14 | F441 H17 |
| 2448 B15 | F442 B9 |
| 2449 B4 | F444 H10 |
| 2450 B5 | F445 F16 |
| 2451 B5 | F446 F16 |
| 2452 B9 | F447 G16 |
| 2453 B14 | F448 G16 |
| 2454 K10 | F449 B16 |
| 2455 B14 | F450 B16 |
| 2456 K10 | F451 B16 |
| 2457 G14 | F452 B16 |
| 2458 G14 | F453 B16 |
| 2459 G3 | F454 B16 |
| 2460 G15 | F455 B16 |
| 2461 I14 | F456 B16 |
| 2462 I14 | F457 C16 |
| 2463 C9 | F458 C16 |
| 3400 A12 | F459 C16 |
| 3401 A13 | F460 H10 |
| 3402 B15 | F461 J14 |
| 3403 B15 | F462 J5 |
| 3404 B15 | F463 J5 |
| 3405 B15 | F464 J5 |
| 3406 B16 | F465 J6 |
| 3407 B16 | F466 J6 |
| 3408 C15 | F467 J6 |
| 3409 C15 | F468 J6 |
| 3411 D14 | F469 J7 |
| 3412 D14 | F470 J7 |
| 3413 D14 | F471 J8 |
| 3414 D14 | F472 J8 |
| 3415 D15 | F473 J9 |
| 3416 D15 | F474 J9 |
| 3417 D15 | F475 J9 |
| 3418 D15 | |
| 3419 D15 | |
| 3420 F15 | |
| 3421 F16 | |
| 3422 G8 | |
| 3423 G16 | |
| 3424 G8 | |
| 3425 G8 | |
| 3426 G8 | |
| 3427 G8 | |
| 3428 G8 | |
| 3429 G8 | |
| 3430 G16 | |
| 3431 G8 | |
| 3432 H8 | |
| 3433 H8 | |
| 3434 H8 | |
| 3435 H8 | |
| 3436 H15 | |
| 3437 H8 | |
| 3438 H15 | |
| 3439 H8 | |
| 3440 H15 | |
| 3441 H8 | |
| 3442 H15 | |
| 3443 H8 | |
| 3444 H8 | |
| 3445 H15 | |
| 3446 H8 | |
| 3447 H8 | |
| 3448 H8 | |
| 3449 H8 | |
| 3450 H8 | |
| 3451 I15 | |
| 3452 D14 | |
| 3453 J5 | |
| 3454 J6 | |
| 3455 J6 | |
| 3456 J6 | |
| 3457 J7 | |
| 3458 J8 | |
| 3459 J9 | |
| 3460 C15 | |
| 3461 H5 | |
| 3462 H5 | |
| 3463 H5 | |
| 3464 I8 | |
| 3468 D14 | |
| 3469 I13 | |
| 3470 I13 | |
| 3471 I14 | |
| 3472 G2 | |
| 3473 C15 | |
| 3474 C15 | |
| 3475 C16 | |
| 3476 C16 | |
| 3477 F16 | |
| 3478 G16 | |

4 - 2

# COMBI BOARD - CIRCUIT DIAGRAM
## AUDIO PART

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1300 B10 | 2307 A5 | 2313 C9 | 2319 D6 | 2325 E8 | 2331 D7 | 3306 C4 | 3313 B2 | 3330 B2 | 3345 C6 | 3354 C8 | 3360 D5 | 3366 E8 | 5301 B9 | 6301 C7 | 7303-B A6 | 7309 E5 | F302 A10 | F308 D5 | F314 B10 |
| 2300 B5 | 2308 B3 | 2314 C6 | 2320 D7 | 2326 E9 | 3300 B5 | 3307 A6 | 3315 B6 | 3335 E4 | 3349 C8 | 3355 E4 | 3361 D7 | 3367 E8 | 5302 B9 | 6302 C10 | 7304 B8 | 7310 C8 | F303 C4 | F309 E8 | |
| 2301 C4 | 2309 B6 | 2315 C2 | 2321 D1 | 2327 C6 | 3301 B4 | 3308 D8 | 3316 B3 | 3336 E4 | 3350 C1 | 3356 C6 | 3362 D6 | 3368 A2 | 5303 B10 | 7300 C3 | 7305 B2 | 7311 C2 | F304 C10 | F310 E9 | |
| 2304 A6 | 2310 B1 | 2316 C10 | 2322 D5 | 2328 B2 | 3302 B5 | 3309 A2 | 3317 B3 | 3337 B1 | 3351 C2 | 3357 C3 | 3363 D2 | 3369 D2 | 5304 C10 | 7301 B4 | 7306 D5 | 7313 E7 | F305 C2 | F311 B10 | |
| 2305 A7 | 2311 B3 | 2317 C3 | 2323 E6 | 2329 D2 | 3303 C4 | 3310 A5 | 3318 B8 | 3341 B7 | 3352 E5 | 3358 A8 | 3364 E8 | 3370 A8 | 5305 D8 | 7302 B4 | 7307 B6 | F300 D9 | F306 A9 | F312 C10 | |
| 2306 A1 | 2312 C9 | 2318 C3 | 2324 E6 | 2330 A7 | 3304 C4 | 3312 A7 | 3324 B1 | 3344 C1 | 3353 C3 | 3359 D2 | 3365 E6 | 3371 D8 | 6300 B7 | 7303-A D6 | 7308 B1 | F301 A1 | F307 D1 | F313 B10 | |

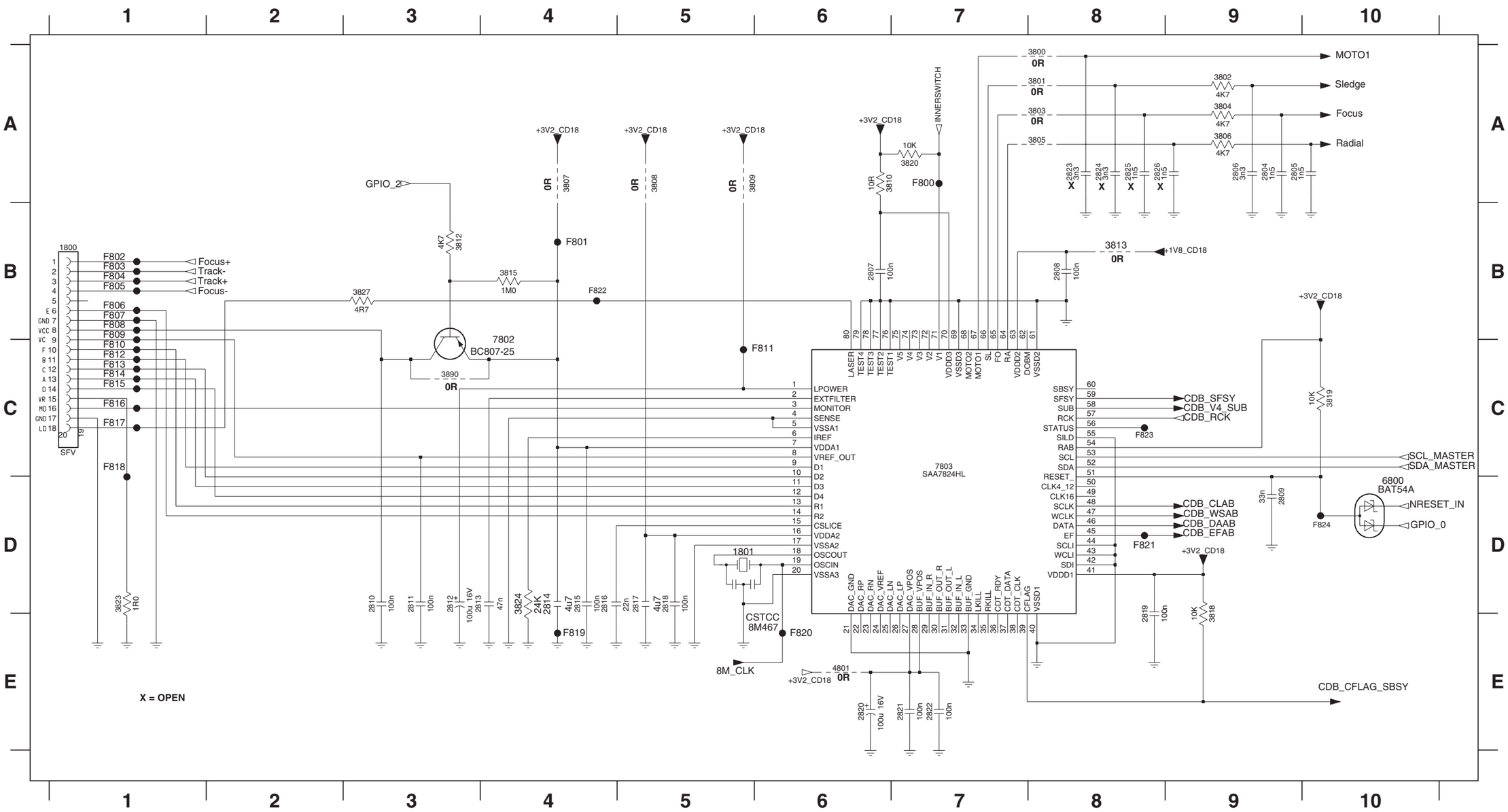



| ✳ | 00 | 17 |
|---|---|---|
| 3308 | 15 | X |
| 3358 | 15 | X |
| 3370 | 10 | 0 |
| 3371 | 10 | 0 |

4 - 3

# COMBI BOARD - CIRCUIT DIAGRAM
# CD DRIVE PART

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1800 B1 | 2805 A9 | 2808 B8 | 2811 D3 | 2814 D4 | 2817 D5 | 2820 E6 | 2823 A8 | 2826 A8 | 3802 A9 | 3805 A8 | 3808 A5 | 3812 B3 | 3818 E9 | 3823 D1 | 3890 C3 | 7802 C4 | F801 B4 | F804 B1 | F807 B1 | F810 C1 | F813 C1 | F816 C1 | F819 E4 | F822 B4 |
| 1801 D5 | 2806 A9 | 2809 D9 | 2812 D3 | 2815 D4 | 2818 D5 | 2821 E7 | 2824 A8 | 3800 A8 | 3803 A8 | 3806 A9 | 3809 A5 | 3813 B8 | 3819 C10 | 3824 D4 | 4801 E6 | 7803 C7 | F802 B1 | F805 B1 | F808 B1 | F811 C6 | F814 C1 | F817 C1 | F820 E6 | F823 C8 |
| 2804 A9 | 2807 B6 | 2810 D3 | 2813 D3 | 2816 D4 | 2819 E8 | 2822 E7 | 2825 A8 | 3801 A8 | 3804 A9 | 3807 A4 | 3810 A6 | 3815 B4 | 3820 A7 | 3827 B3 | 6800 D10 | F800 A7 | F803 B1 | F806 B1 | F809 B1 | F812 C1 | F815 C1 | F818 C1 | F821 D8 | F824 D10 |



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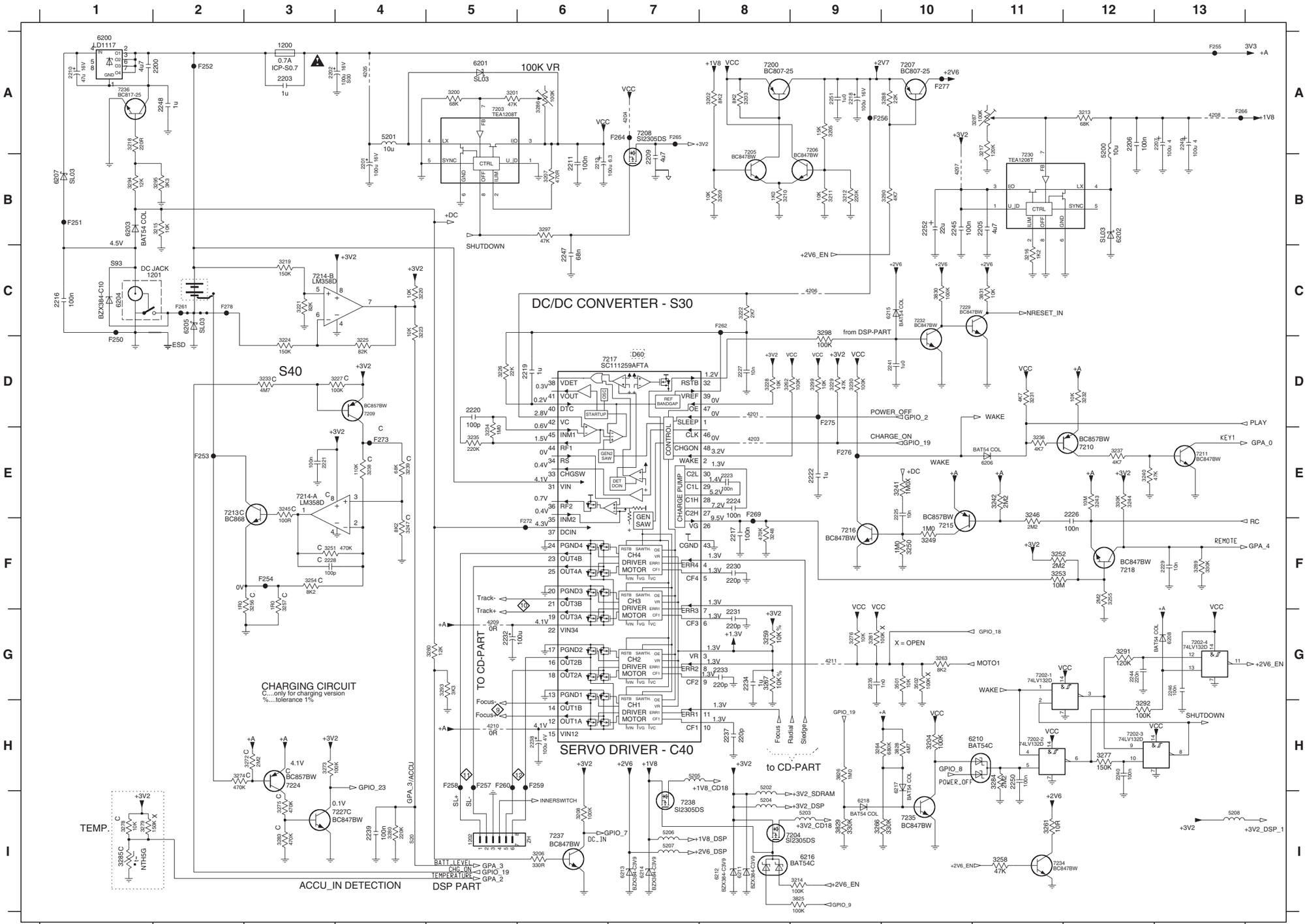
# COMBI BOARD - CIRCUIT DIAGRAM
# POWER SUPPLY PART




| | | |
|---|---|---|
| 1200 A3 | 3274 H2 | F272 F6 |
| 1201 C2 | 3275 I3 | F273 E4 |
| 1202 I5 | 3276 G9 | F275 D9 |
| 2200 A2 | 3277 H12 | F276 E9 |
| 2201 B4 | 3278 I1 | F277 A10 |
| 2202 A3 | 3279 I1 | F278 C2 |
| 2203 A3 | 3280 I4 | |
| 2205 B11 | 3281 G9 | |
| 2206 A12 | 3283 I3 | |
| 2207 A13 | 3284 H11 | |
| 2209 B7 | 3285 I1 | |
| 2210 A1 | 3286 A6 | |
| 2211 B6 | 3287 A10 | |
| 2212 B6 | 3288 A10 | |
| 2216 C1 | 3289 F13 | |
| 2217 F8 | 3290 B10 | |
| 2218 A9 | 3291 G12 | |
| 2219 D6 | 3292 H12 | |
| 2220 D5 | 3293 G5 | |
| 2221 E3 | 3294 B1 | |
| 2222 E9 | 3295 B2 | |
| 2223 E8 | 3297 B6 | |
| 2224 E8 | 3298 C9 | |
| 2225 E10 | 3299 D9 | |
| 2226 E12 | 3501 G10 | |
| 2227 D8 | 3502 G10 | |
| 2228 F3 | 3825 I9 | |
| 2229 F13 | 3826 H9 | |
| 2230 F8 | 3828 H10 | |
| 2231 G8 | 3829 I9 | |
| 2232 G5 | 3830 C10 | |
| 2233 G8 | 3831 C11 | |
| 2234 G8 | 4201 D8 | |
| 2235 G9 | 4203 E8 | |
| 2237 H8 | 4204 A7 | |
| 2238 H6 | 4205 A4 | |
| 2239 I4 | 4206 C9 | |
| 2240 H12 | 4207 B10 | |
| 2241 D10 | 4208 A13 | |
| 2244 G12 | 4209 G5 | |
| 2245 B10 | 4210 H5 | |
| 2246 G13 | 4211 G9 | |
| 2247 C6 | 5200 A12 | |
| 2248 A2 | 5201 A4 | |
| 2249 A13 | 5202 H8 | |
| 2250 H11 | 5203 I9 | |
| 2251 A9 | 5204 I8 | |
| 2252 B10 | 5205 H7 | |
| 3200 A5 | 5206 I7 | |
| 3201 A5 | 5207 I7 | |
| 3202 A8 | 5208 I13 | |
| 3203 A8 | 6200 A1 | |
| 3204 H10 | 6201 A5 | |
| 3205 A9 | 6202 B12 | |
| 3206 I6 | 6203 B1 | |
| 3207 B6 | 6204 C1 | |
| 3208 I6 | 6205 C2 | |
| 3209 B8 | 6206 E11 | |
| 3210 B8 | 6207 B1 | |
| 3211 B9 | 6208 G13 | |
| 3212 B9 | 6210 H11 | |
| 3213 A12 | 6211 I8 | |
| 3214 I9 | 6212 I8 | |
| 3215 B2 | 6213 I7 | |
| 3216 C11 | 6214 I7 | |
| 3217 A11 | 6215 C10 | |
| 3218 A1 | 6216 I9 | |
| 3219 C3 | 6217 H10 | |
| 3220 C4 | 6218 I9 | |
| 3221 C3 | 7200 A8 | |
| 3222 C8 | 7202-1 G11 | |
| 3223 C4 | 7202-2 H11 | |
| 3224 D3 | 7202-3 H12 | |
| 3225 D4 | 7202-4 G13 | |
| 3226 D5 | 7203 A5 | |
| 3227 D4 | 7204 I9 | |
| 3228 D8 | 7205 A8 | |
| 3229 D9 | 7206 A9 | |
| 3230 D9 | 7207 A10 | |
| 3231 D11 | 7208 A7 | |
| 3232 D12 | 7209 D4 | |
| 3233 D3 | 7210 E12 | |
| 3234 E5 | 7211 E13 | |
| 3235 E5 | 7213 E2 | |
| 3236 E11 | 7214-A E3 | |
| 3237 E12 | 7214-B C3 | |
| 3238 E4 | 7215 F10 | |
| 3239 E4 | 7216 F9 | |
| 3240 E12 | 7217 D7 | |
| 3241 E10 | 7218 F12 | |
| 3242 E11 | 7224 H3 | |
| 3243 E12 | 7227 I3 | |
| 3244 E12 | 7229 C10 | |
| 3245 E3 | 7230 B11 | |
| 3246 E11 | 7232 C10 | |
| 3247 F4 | 7234 I11 | |
| 3248 F8 | 7235 I10 | |
| 3249 F10 | 7236 A1 | |
| 3250 F10 | 7237 I6 | |
| 3251 F3 | 7238 I7 | |
| 3252 F11 | F250 D1 | |
| 3253 F11 | F251 B1 | |
| 3254 F3 | F252 A2 | |
| 3255 F12 | F253 E2 | |
| 3256 F3 | F254 F3 | |
| 3257 F3 | F255 A13 | |
| 3258 I11 | F256 A9 | |
| 3259 G8 | F257 H5 | |
| 3260 G5 | F258 H5 | |
| 3261 I11 | F259 H6 | |
| 3262 D8 | F260 H5 | |
| 3263 G10 | F261 C2 | |
| 3264 H9 | F262 C8 | |
| 3266 I9 | F264 A7 | |
| 3267 G8 | F265 A7 | |
| 3272 H3 | F266 A13 | |
| 3273 H3 | F269 E8 | |

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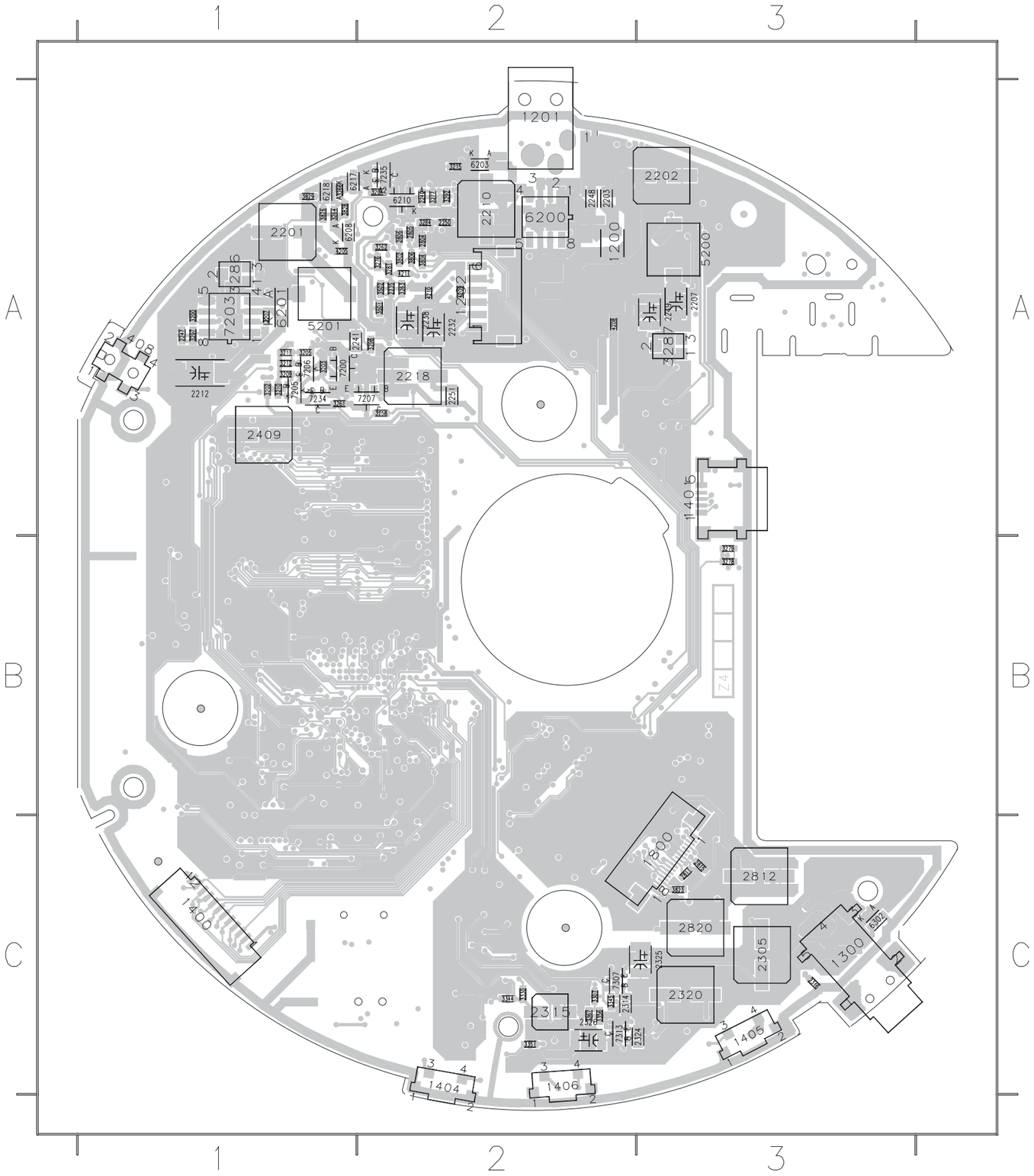
## COMBI BOARD - LAYOUT DIAGRAM
## COMPONENT SIDE VIEW




| | | | |
|---|---|---|---|
| 1200 | A2 | 3367 | C2 |
| 1201 | A2 | 3501 | A2 |
| 1202 | A2 | 3502 | A2 |
| 1300 | C3 | 3802 | A2 |
| 1400 | C1 | 3804 | A2 |
| 1401 | A3 | 3806 | A2 |
| 1404 | C2 | 3823 | C3 |
| 1405 | C3 | 3826 | A1 |
| 1406 | C2 | 3828 | A1 |
| 1408 | A1 | 3829 | A1 |
| 1800 | C3 | 4205 | A1 |
| 2201 | A1 | 4208 | A2 |
| 2202 | A3 | 4209 | A2 |
| 2203 | A2 | 4210 | A2 |
| 2207 | A3 | 4211 | A2 |
| 2210 | A2 | 5200 | A3 |
| 2212 | A1 | 5201 | A1 |
| 2218 | A2 | 6200 | A2 |
| 2232 | A2 | 6201 | A1 |
| 2235 | A2 | 6203 | A2 |
| 2238 | A2 | 6208 | A1 |
| 2240 | A2 | 6210 | A2 |
| 2241 | A1 | 6217 | A1 |
| 2247 | A1 | 6218 | A1 |
| 2248 | A2 | 6302 | C3 |
| 2249 | A3 | 7200 | A1 |
| 2250 | A2 | 7203 | A1 |
| 2251 | A2 | 7205 | A1 |
| 2305 | C3 | 7206 | A1 |
| 2314 | C2 | 7207 | A2 |
| 2315 | C2 | 7234 | A1 |
| 2316 | C3 | 7235 | A2 |
| 2320 | C3 | 7307 | C2 |
| 2324 | C3 | 7313 | C2 |
| 2325 | C3 | | |
| 2326 | C2 | | |
| 2409 | A1 | | |
| 2804 | A2 | | |
| 2805 | A2 | | |
| 2806 | A2 | | |
| 2811 | C3 | | |
| 2812 | C3 | | |
| 2815 | C3 | | |
| 2820 | C3 | | |
| 3200 | A1 | | |
| 3202 | A1 | | |
| 3203 | A1 | | |
| 3204 | A2 | | |
| 3205 | A1 | | |
| 3207 | A1 | | |
| 3209 | A1 | | |
| 3210 | A1 | | |
| 3211 | A1 | | |
| 3212 | A1 | | |
| 3215 | A2 | | |
| 3258 | A2 | | |
| 3261 | A1 | | |
| 3262 | A2 | | |
| 3263 | A2 | | |
| 3264 | A1 | | |
| 3266 | A1 | | |
| 3276 | A2 | | |
| 3277 | A2 | | |
| 3278 | B3 | | |
| 3279 | B3 | | |
| 3281 | A2 | | |
| 3284 | A2 | | |
| 3286 | A1 | | |
| 3287 | A3 | | |
| 3292 | A2 | | |
| 3297 | A1 | | |
| 3298 | A2 | | |
| 3307 | C2 | | |
| 3330 | C2 | | |
| 3344 | C2 | | |
| 3345 | C2 | | |
| 3351 | C2 | | |
| 3356 | C2 | | |

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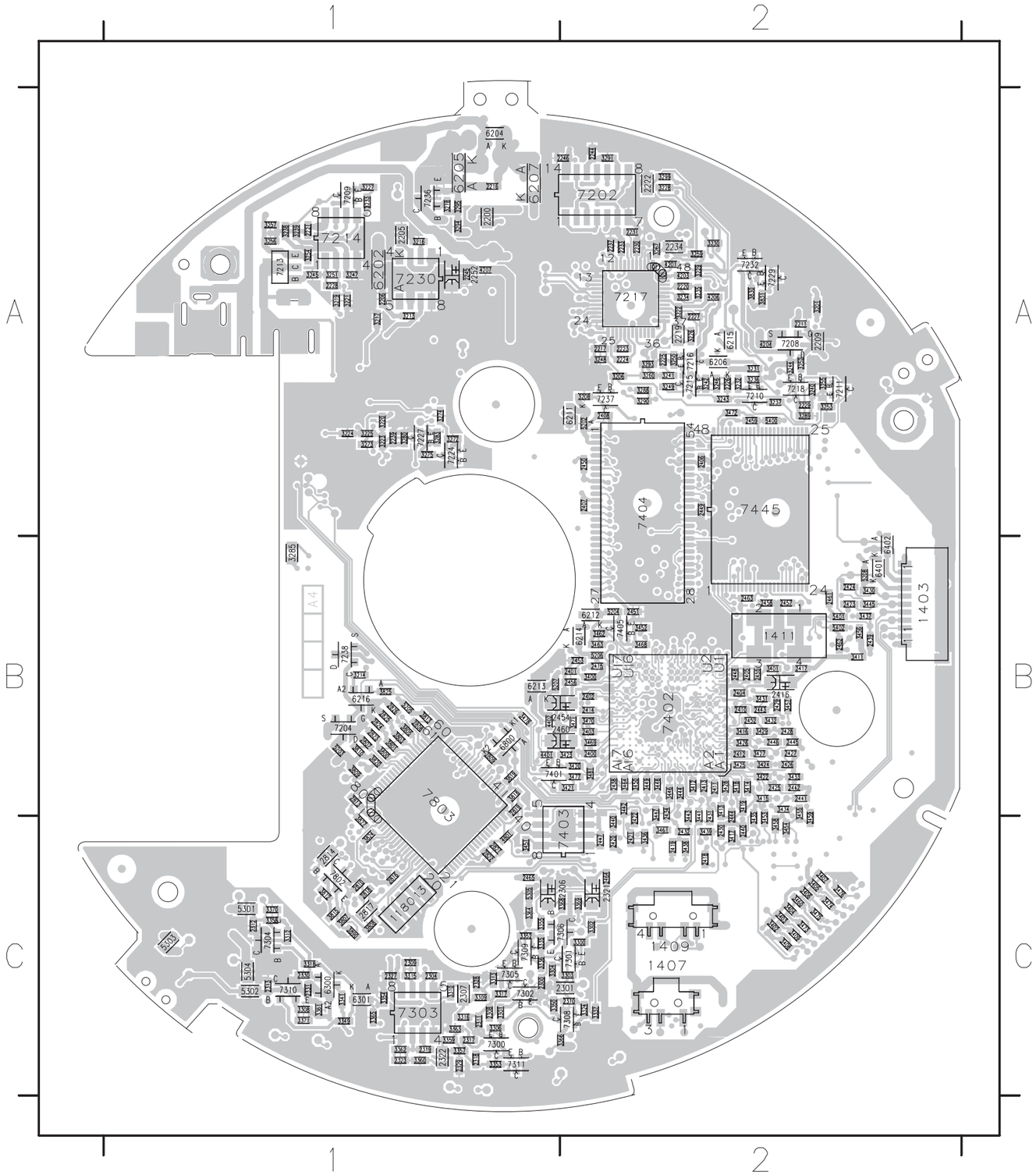
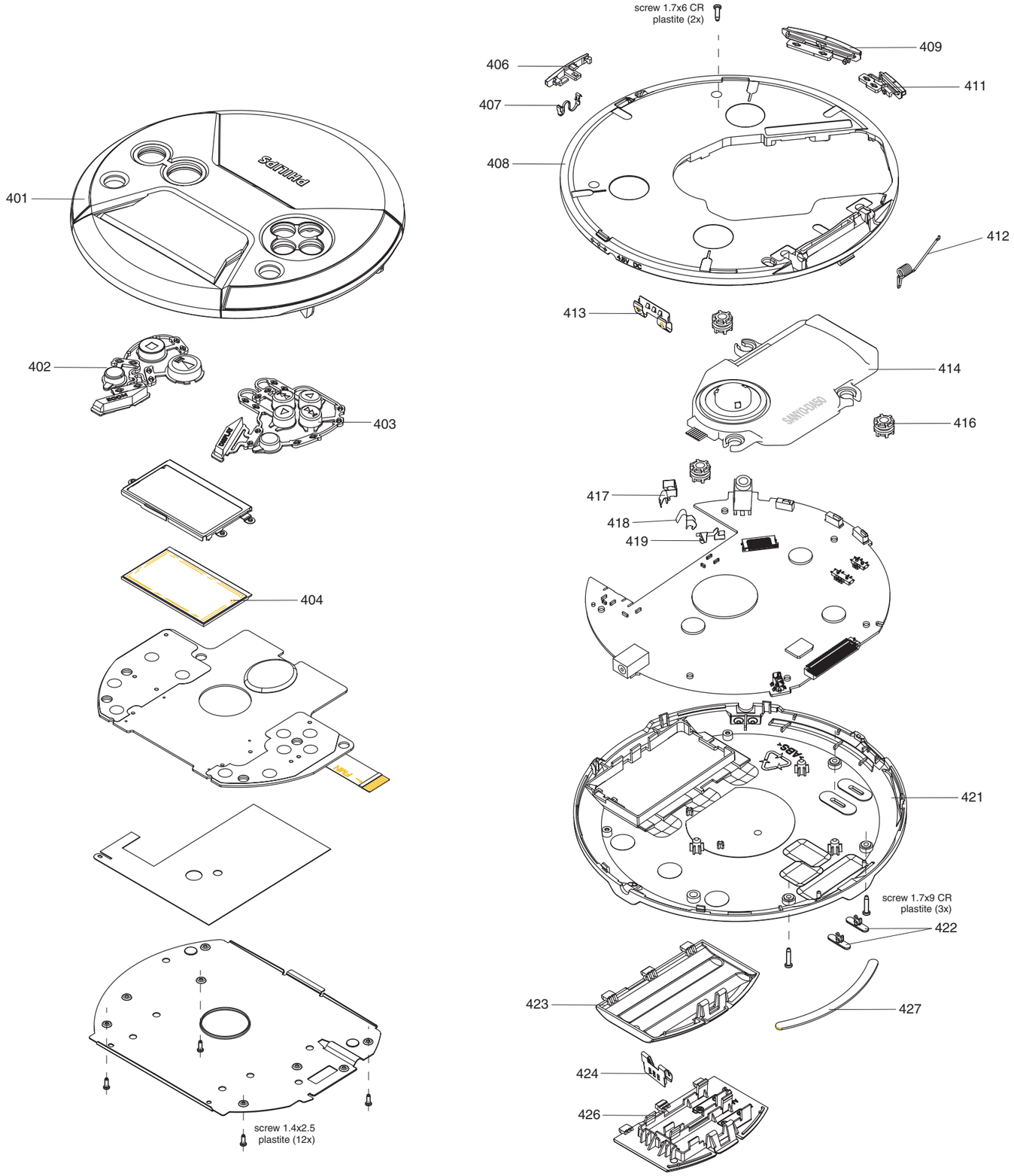
## COMBI BOARD - LAYOUT DIAGRAM
## COPPER SIDE VIEW




| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1403 | B2 | 2424 | B2 | 3235 | A2 | 3369 | C2 | 3481 | B2 | 7237 | A2 |
| 1407 | C2 | 2425 | B2 | 3236 | A2 | 3370 | C1 | 3800 | B1 | 7238 | B1 |
| 1409 | C2 | 2426 | B2 | 3237 | A2 | 3371 | C1 | 3801 | B1 | 7300 | C1 |
| 1411 | B2 | 2427 | B2 | 3238 | A1 | 3400 | B2 | 3803 | B1 | 7301 | C2 |
| 1801 | C1 | 2428 | B2 | 3239 | A1 | 3401 | B2 | 3805 | B1 | 7302 | C1 |
| 2200 | A1 | 2429 | B2 | 3240 | A2 | 3402 | C2 | 3807 | C1 | 7303 | C1 |
| 2205 | A1 | 2430 | C2 | 3241 | A2 | 3403 | C2 | 3808 | C1 | 7304 | C1 |
| 2206 | A1 | 2431 | C2 | 3242 | A2 | 3404 | C2 | 3809 | B1 | 7305 | C1 |
| 2209 | A2 | 2432 | C2 | 3243 | A2 | 3405 | C2 | 3810 | B1 | 7306 | C2 |
| 2211 | A2 | 2434 | B2 | 3244 | A2 | 3406 | C2 | 3812 | C1 | 7308 | C2 |
| 2216 | A1 | 2438 | B2 | 3245 | A1 | 3407 | C2 | 3813 | B1 | 7309 | C1 |
| 2217 | A2 | 2439 | B2 | 3246 | A2 | 3408 | C2 | 3815 | C1 | 7310 | C1 |
| 2219 | A2 | 2440 | C2 | 3247 | A1 | 3409 | C2 | 3818 | B1 | 7311 | C1 |
| 2220 | A2 | 2441 | B2 | 3248 | A2 | 3411 | B2 | 3819 | B1 | 7401 | B1 |
| 2221 | A1 | 2442 | B2 | 3249 | A2 | 3412 | B2 | 3820 | B1 | 7402 | B2 |
| 2222 | A2 | 2443 | B2 | 3250 | A2 | 3413 | B2 | 3824 | C1 | 7403 | C2 |
| 2223 | A2 | 2444 | C2 | 3251 | A1 | 3414 | B2 | 3825 | B1 | 7404 | A2 |
| 2224 | A2 | 2445 | B2 | 3252 | A2 | 3415 | B2 | 3827 | C1 | 7405 | B2 |
| 2225 | A2 | 2446 | B2 | 3253 | A2 | 3416 | B2 | 3830 | A2 | 7445 | A2 |
| 2226 | A2 | 2447 | C2 | 3254 | A1 | 3417 | C2 | 3831 | A2 | 7802 | C1 |
| 2227 | A2 | 2448 | B2 | 3255 | A2 | 3418 | B2 | 3890 | C1 | 7803 | B1 |
| 2228 | A1 | 2449 | A2 | 3256 | A1 | 3419 | B2 | 4201 | A2 | | |
| 2229 | A2 | 2450 | A2 | 3257 | A1 | 3420 | B2 | 4203 | A2 | | |
| 2230 | A2 | 2451 | B2 | 3259 | A2 | 3421 | B2 | 4204 | A2 | | |
| 2231 | A2 | 2452 | B2 | 3260 | A2 | 3422 | B2 | 4206 | A2 | | |
| 2233 | A2 | 2453 | B2 | 3267 | A2 | 3423 | B2 | 4207 | A1 | | |
| 2234 | A2 | 2454 | B2 | 3272 | A1 | 3424 | B2 | 4401 | B1 | | |
| 2237 | A2 | 2455 | B2 | 3273 | A1 | 3425 | B2 | 4402 | B1 | | |
| 2239 | A1 | 2456 | B2 | 3274 | A1 | 3426 | B2 | 4801 | C1 | | |
| 2244 | A2 | 2457 | B2 | 3275 | A1 | 3427 | B2 | 5202 | A2 | | |
| 2245 | A1 | 2458 | B2 | 3280 | A1 | 3428 | B2 | 5203 | B1 | | |
| 2246 | A2 | 2459 | A2 | 3283 | A1 | 3429 | B2 | 5204 | B2 | | |
| 2252 | A1 | 2460 | B2 | 3285 | B1 | 3430 | B2 | 5205 | B1 | | |
| 2300 | C1 | 2461 | B2 | 3288 | A2 | 3431 | B2 | 5206 | B2 | | |
| 2301 | C2 | 2462 | B2 | 3289 | A2 | 3432 | B2 | 5207 | B1 | | |
| 2304 | C1 | 2463 | B2 | 3290 | A2 | 3433 | B2 | 5208 | B2 | | |
| 2306 | C2 | 2464 | C2 | 3291 | A2 | 3434 | B2 | 5301 | C1 | | |
| 2307 | C1 | 2465 | C1 | 3293 | A2 | 3435 | C2 | 5302 | C1 | | |
| 2308 | C1 | 2807 | B1 | 3294 | A1 | 3436 | C2 | 5303 | C1 | | |
| 2309 | C1 | 2808 | B1 | 3295 | A1 | 3437 | B2 | 5304 | C1 | | |
| 2310 | C2 | 2809 | B1 | 3299 | A2 | 3438 | C2 | 5305 | C1 | | |
| 2311 | C1 | 2810 | C1 | 3300 | C2 | 3439 | C2 | 5400 | A2 | | |
| 2312 | C1 | 2813 | B1 | 3301 | C1 | 3440 | C2 | 5401 | B2 | | |
| 2313 | C1 | 2814 | C1 | 3302 | C2 | 3441 | C2 | 5402 | B2 | | |
| 2317 | C1 | 2816 | C1 | 3303 | C2 | 3442 | B2 | 6202 | A1 | | |
| 2318 | C1 | 2817 | C1 | 3304 | C1 | 3443 | C2 | 6204 | A1 | | |
| 2319 | C1 | 2818 | C1 | 3306 | C1 | 3444 | B2 | 6205 | A1 | | |
| 2321 | C2 | 2819 | B1 | 3308 | C1 | 3445 | B2 | 6206 | A2 | | |
| 2322 | C1 | 2821 | C1 | 3309 | C1 | 3446 | B2 | 6207 | A1 | | |
| 2323 | C1 | 2822 | C1 | 3310 | C1 | 3447 | B2 | 6211 | A2 | | |
| 2327 | C1 | 2823 | B1 | 3312 | C1 | 3448 | B2 | 6212 | B2 | | |
| 2328 | C1 | 2824 | B1 | 3313 | C1 | 3449 | B2 | 6213 | B1 | | |
| 2329 | C1 | 2825 | B1 | 3315 | C1 | 3450 | B2 | 6214 | B2 | | |
| 2330 | C1 | 2826 | B1 | 3316 | C1 | 3451 | C1 | 6215 | A2 | | |
| 2331 | C1 | 3201 | A2 | 3317 | C1 | 3452 | B2 | 6216 | B1 | | |
| 2400 | B2 | 3206 | A2 | 3318 | C1 | 3453 | C2 | 6300 | C1 | | |
| 2401 | B2 | 3208 | A2 | 3324 | C2 | 3454 | C2 | 6301 | C1 | | |
| 2402 | B2 | 3213 | A1 | 3335 | C1 | 3455 | B2 | 6401 | B2 | | |
| 2403 | B2 | 3214 | B1 | 3336 | C1 | 3456 | B2 | 6402 | B2 | | |
| 2404 | B2 | 3216 | A1 | 3337 | C2 | 3457 | B2 | 6800 | B1 | | |
| 2405 | B2 | 3217 | A1 | 3341 | C1 | 3458 | C2 | 7202 | A2 | | |
| 2406 | A2 | 3218 | A1 | 3349 | C1 | 3459 | C2 | 7204 | B1 | | |
| 2407 | A2 | 3219 | A1 | 3350 | C1 | 3460 | C2 | 7208 | A2 | | |
| 2408 | A2 | 3220 | A1 | 3352 | C1 | 3461 | C2 | 7209 | A1 | | |
| 2410 | B2 | 3221 | A1 | 3353 | C1 | 3462 | B2 | 7210 | A2 | | |
| 2411 | B2 | 3222 | A2 | 3354 | C1 | 3463 | B2 | 7211 | A2 | | |
| 2412 | B2 | 3223 | A1 | 3355 | C1 | 3464 | B2 | 7213 | A1 | | |
| 2413 | B2 | 3224 | A1 | 3357 | C1 | 3468 | B2 | 7214 | A1 | | |
| 2414 | B2 | 3225 | A1 | 3358 | C1 | 3469 | B2 | 7215 | A2 | | |
| 2415 | B2 | 3226 | A2 | 3359 | C1 | 3470 | B2 | 7216 | A2 | | |
| 2416 | B2 | 3227 | A1 | 3360 | C1 | 3471 | B2 | 7217 | A2 | | |
| 2417 | B2 | 3228 | A2 | 3361 | C1 | 3472 | A2 | 7218 | A2 | | |
| 2418 | C2 | 3229 | A2 | 3362 | C1 | 3473 | C2 | 7224 | A1 | | |
| 2419 | C2 | 3230 | A2 | 3363 | C1 | 3474 | C2 | 7227 | A1 | | |
| 2420 | C2 | 3231 | A2 | 3364 | C1 | 3475 | C2 | 7229 | A2 | | |
| 2421 | C2 | 3232 | A2 | 3365 | C1 | 3476 | C2 | 7230 | A1 | | |
| 2422 | C2 | 3233 | A1 | 3366 | C2 | 3477 | B2 | 7232 | A2 | | |
| 2423 | B2 | 3234 | A2 | 3368 | C2 | 3478 | B1 | 7236 | A1 | | |

## EXPLODED VIEW DIAGRAM

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## MECHANICAL PARTSLIST

| | | |
|---|---|---|
| 401 | 3140 117 66021 | CD-DOOR-ASSY-EXP521 |
| 402 | 3140 117 67451 | KEY-GAMES-ASSY-EXP521 |
| 403 | 3140 117 67461 | KEY-SHOOT-ASSY-EXP521 |
| 404 | 3140 110 51821 | LCD MODULE - EXP521 |
| 406 | 3140 117 66991 | SLIDER-DOOR-OPEN-AX5215 |
| 407 | 3140 111 22611 | SPRING-SLIDER-OPEN-AX5203 |
| 408 | 3140 117 66941 | CABINET-AX5215-ASSY-1 |
| 409 | 3140 117 67001 | KNOB-VOLUME-AX5215 |
| 411 | 3140 117 67011 | KNOB-DBB-AX5215 |
| 412 | 3140 111 01501 | SPRING-CD DOOR EXP521 |
| 413 | 3140 111 22621 | SPRING-BATTERY-SET, +/- AX5203 |
| 414 | 2422 549 45374 | CD DRIVE DA50 |
| 416 | 3140 114 47581 | DAMPER-AX5203 |
| 417 | 3140 111 22571 | SPRING BATTERY, +VE AX5203 |
| 418 | 3140 111 22581 | SPRING BATTERY, -VE AX5203 |
| 419 | 3140 111 22601 | SPRING BATTERY CHARGE-AX5203 |
| 421 | 3140 117 67351 | BOTTOM-AX5202-ASSY-1 |
| 422 | 3140 117 67161 | SLIDER-HOLD-AX5203 |
| 423 | 3140 117 66471 | DOOR-BATTERY-2A-AX5203 |
| 424 | 3140 111 22631 | SPRING BATTERY-DOOR +/- AX5203 |
| 426 | 3140 117 67031 | DOOR-BATTERY-3A-AX5215-ASSY |
| 427 | 3140 114 49361 | RUBBER-FOOT |

**Note: Only these parts mentioned in the list are normal service parts.**

# ELECTRICAL PARTSLIST - COMBI BOARD

## - MISCELLANEOUS -

| | | |
|---|---|---|
| 1200 | 2422 086 11012 | FUSE 0,7A 50V |
| 1201 | 2422 026 05086 | CONNECTOR SUPP H 1P |
| 1202 | 2422 025 12918 | CONNECTOR H 6P |
| 1300 | 2422 026 05317 | SOCKET PHONE H 1P |
| 1403 | 2422 025 17034 | SOCKET FFC H 11P |
| 1404 | 2422 128 02863 | SWITCH-TACT |
| 1405 | 2422 128 02863 | SWITCH-TACT |
| 1406 | 2422 128 02863 | SWITCH-TACT |
| 1407 | 2422 127 00543 | SWITCH-SLID |
| 1408 | 2422 129 16818 | SWITCH-DET |
| 1409 | 2422 127 00547 | SWITCH-SLID |
| 1411 | 2422 543 01106 | CRYSTAL |
| 1800 | 2422 025 17917 | SOCKET FFC H 18P |

## - CAPACITORS -

| | | |
|---|---|---|
| 2200 | 2020 552 96305 | 4,7µF +80-20% Y5V 10V |
| 2201 | 4822 124 12095 | 100µF 20% 16V |
| 2202 | 4822 124 12095 | 100µF 20% 16V |
| 2203 | 4822 126 14472 | 1µF 10% X7 10V |
| 2205 | 2020 552 96305 | 4,7µF +80-20% Y5V 10V |
| 2206 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2207 | 3198 032 15190 | 100µF 20% 4V |
| 2209 | 2020 552 96305 | 4,7µF +80-20% Y5V 10V |
| 2210 | 4822 124 80151 | 47µF 16V |
| 2211 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2212 | 3198 032 27190 | 100µF 20% 4V |
| 2216 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2217 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2218 | 4822 124 12095 | 100µF 20% 16V |
| 2219 | 4822 126 14472 | 1µF 10% X7 10V |
| 2220 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2221 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2222 | 4822 126 14472 | 1µF 10% X7 10V |
| 2223 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2224 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2225 | 5322 126 11583 | 10nF 10% X7 50V |
| 2226 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2227 | 5322 126 11583 | 10nF 10% X7 50V |
| 2228 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2229 | 5322 126 11583 | 10nF 10% X7 50V |
| 2230 | 4822 126 13883 | 220pF 5% 50V |
| 2231 | 4822 126 13883 | 220pF 5% 50V |
| 2232 | 3198 032 15190 | 100µF 20% 4V |
| 2233 | 4822 126 13883 | 220pF 5% 50V |
| 2234 | 4822 126 14472 | 1µF 10% X7 10V |
| 2235 | 5322 126 11578 | 1nF 10% X7 50V |
| 2237 | 4822 126 13883 | 220pF 5% 50V |
| 2238 | 3198 032 15190 | 100µF 20% 4V |
| 2239 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2240 | 2238 586 59812 | 100nF +80-20% Y5V 50V |

## - CAPACITORS -

| | | |
|---|---|---|
| 2241 | 4822 126 14043 | 1µF +80-20% Y5V 16V |
| 2244 | 4822 126 13879 | 220nF +80-20% 16V |
| 2245 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2246 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2247 | 3198 017 36830 | 68nF X7 16V |
| 2248 | 4822 126 14472 | 1µF 10% X7 10V |
| 2249 | 3198 032 15190 | 100µF 20% 4V |
| 2250 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2251 | 4822 126 14043 | 1µF +80-20% Y5V 16V |
| 2252 | 4822 124 11946 | 22µF 20% 16V |
| 2300 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2301 | 2020 552 96305 | 4,7µF +80-20% Y5V 10V |
| 2304 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2305 | 4822 124 81059 | 220µF 20% 4V |
| 2306 | 4822 124 11946 | 22µF 20% 16V |
| 2307 | 4822 126 14491 | 2,2µF 10V |
| 2308 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2309 | 2222 867 15339 | 33pF 5% NP0 50V |
| 2310 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2311 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2312 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2313 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2314 | 4822 126 14472 | 1µF 10% X7 10V |
| 2315 | 4822 124 23002 | 10µF 16V |
| 2316 | 4822 126 13883 | 220pF 5% 50V |
| 2317 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2318 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2319 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2320 | 4822 124 81059 | 220µF 20% 4V |
| 2321 | 4822 124 11946 | 22µF 20% 16V |
| 2322 | 4822 126 14491 | 2,2µF 10V |
| 2323 | 2222 867 15339 | 33pF 5% NP0 50V |
| 2324 | 4822 126 14472 | 1µF 10% X7 10V |
| 2325 | 3198 032 15190 | 100µF 20% 4V |
| 2326 | 2022 009 00656 | 47µF 20% 6,3V |
| 2327 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2328 | 4822 126 14315 | 390pF 5% NP0 50V |
| 2329 | 4822 126 14315 | 390pF 5% NP0 50V |
| 2330 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2331 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2400 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2401 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2402 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2403 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2404 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2405 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2406 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2407 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2408 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2409 | 4822 124 80151 | 47µF 16V |

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ELECTRICAL PARTSLIST - COMBI BOARD

## - CAPACITORS -

| | | |
|---|---|---|
| 2410 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2411 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2412 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2413 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2414 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2415 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2416 | 2020 004 90283 | 10µF 20%10V |
| 2417 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2421 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2422 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2423 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2424 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2425 | 5322 126 11583 | 10nF 10% X7 50V |
| 2426 | 5322 126 11583 | 10nF 10% X7 50V |
| 2427 | 5322 126 11583 | 10nF 10% X7 50V |
| 2428 | 5322 126 11583 | 10nF 10% X7 50V |
| 2429 | 5322 126 11583 | 10nF 10% X7 50V |
| 2430 | 5322 126 11583 | 10nF 10% X7 50V |
| 2431 | 5322 126 11583 | 10nF 10% X7 50V |
| 2432 | 5322 126 11583 | 10nF 10% X7 50V |
| 2434 | 5322 126 11583 | 10nF 10% X7 50V |
| 2438 | 5322 126 11583 | 10nF 10% X7 50V |
| 2439 | 5322 126 11583 | 10nF 10% X7 50V |
| 2440 | 5322 126 11583 | 10nF 10% X7 50V |
| 2441 | 5322 126 11583 | 10nF 10% X7 50V |
| 2442 | 5322 126 11583 | 10nF 10% X7 50V |
| 2443 | 5322 126 11583 | 10nF 10% X7 50V |
| 2444 | 5322 126 11583 | 10nF 10% X7 50V |
| 2445 | 5322 126 11583 | 10nF 10% X7 50V |
| 2446 | 5322 126 11583 | 10nF 10% X7 50V |
| 2447 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2448 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2449 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2450 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2451 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2452 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2453 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2454 | 2020 004 90283 | 10µF 20% F93 10V |
| 2455 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2456 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2457 | 4822 126 14225 | 56pF 5% NP0 50V |
| 2458 | 4822 126 14225 | 56pF 5% NP0 50V |
| 2459 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2460 | 4822 124 11946 | 22µF 20% 16V |
| 2461 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2462 | 2020 552 94427 | 100pF 5% NP0 50V |
| 2463 | 5322 126 11578 | 1nF 10% X7 50V |
| 2804 | 4822 126 14247 | 1,5nF X7 50V |
| 2805 | 4822 126 14247 | 1,5nF X7 50V |
| 2806 | 5322 126 11579 | 3,3nF 10% X7 63V |

## - CAPACITORS -

| | | |
|---|---|---|
| 2807 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2808 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2809 | 4822 126 14549 | 33nF 16V X7 |
| 2810 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2811 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2812 | 4822 124 12095 | 100µF 20% 16V |
| 2813 | 3198 024 44730 | 47nF Y5V 50V |
| 2814 | 2020 552 96305 | 4,7µF +80-20% Y5V 10V |
| 2815 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2816 | 3198 017 42230 | 22nF Y5V 50V |
| 2817 | 2020 552 96305 | 4,7µF +80-20% Y5V 10V |
| 2818 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2819 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2820 | 4822 124 12095 | 100µF 20% 16V |
| 2821 | 2238 586 59812 | 100nF +80-20% Y5V 50V |
| 2822 | 2238 586 59812 | 100nF +80-20% Y5V 50V |

## - RESISTORS -

| | | |
|---|---|---|
| 3200 | 4822 051 30683 | 68K 5% 0,062W |
| 3201 | 4822 117 12925 | 47K 1% 0,063W |
| 3202 | 4822 117 12902 | 8,2K 1% 0,063W |
| 3203 | 4822 117 12902 | 8,2K 1% 0,063W |
| 3204 | 4822 117 13632 | 100K 1% 0,62W |
| 3205 | 4822 051 30153 | 15K 5% 0,062W |
| 3206 | 4822 051 30331 | 330 5% 0,062W |
| 3207 | 4822 051 30471 | 470 5% 0,062W |
| 3208 | 4822 117 13632 | 100K 1% 0,62W |
| 3209 | 4822 051 30103 | 10K 5% 0,062W |
| 3210 | 4822 051 30102 | 1K 5% 0,062W |
| 3211 | 4822 051 30103 | 10K 5% 0,062W |
| 3212 | 4822 117 12891 | 220K 1% |
| 3213 | 4822 051 30683 | 68K 5% 0,062W |
| 3214 | 4822 117 13632 | 100K 1% 0,62W |
| 3215 | 4822 051 30103 | 10K 5% 0,062W |
| 3216 | 4822 117 11817 | 1,2K 1% 1/16W |
| 3217 | 4822 051 30124 | 120K 5% 0,062W |
| 3218 | 4822 051 30221 | 220 5% 0,062W |
| 3219 | 2322 704 61504 | 150K 1% |
| 3220 | 4822 051 30103 | 10K 5% 0,062W |
| 3221 | 2322 704 68203 | 82K 1% |
| 3222 | 4822 051 30272 | 2,7K 5% 0,062W |
| 3223 | 4822 051 30103 | 10K 5% 0,062W |
| 3224 | 2322 704 61504 | 150K 1% |
| 3225 | 2322 704 68203 | 82K 1% |
| 3226 | 4822 051 30223 | 22K 5% 0,062W |
| 3227 | 4822 117 13632 | 100K 1% 0,62W |
| 3228 | 4822 051 30103 | 10K 5% 0,062W |
| 3229 | 4822 117 12925 | 47K 1% 0,063W |

## ELECTRICAL PARTSLIST - COMBI BOARD

### - RESISTORS -

| | | |
|---|---|---|
| 3230 | 4822 117 13632 | 100K 1% 0,62W |
| 3231 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3232 | 4822 051 30103 | 10K 5% 0,062W |
| 3233 | 4822 117 12891 | 220K 1% |
| 3234 | 4822 051 30105 | 1M 5% 0,062W |
| 3235 | 4822 117 12891 | 220K 1% |
| 3236 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3237 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3238 | 2322 704 81104 | 110K 1% |
| 3239 | 4822 051 30683 | 68K 5% 0,062W |
| 3240 | 4822 117 12925 | 47K 1% 0,063W |
| 3241 | 4822 051 30105 | 1M 5% 0,062W |
| 3242 | 3198 021 32250 | 2,2M 5% |
| 3243 | 3198 021 31060 | 10M 5% |
| 3244 | 4822 051 30334 | 330K 5% 0,062W |
| 3245 | 4822 051 30101 | 100R 5% 0,062W |
| 3246 | 3198 021 32250 | 2,2M 5% |
| 3247 | 4822 117 12902 | 8,2K 1% 0,063W |
| 3248 | 4822 051 30474 | 470K 5% 0,062W |
| 3249 | 4822 051 30105 | 1M 5% 0,062W |
| 3250 | 4822 051 30105 | 1M 5% 0,062W |
| 3251 | 4822 051 30474 | 470K 5% 0,062W |
| 3252 | 3198 021 32250 | 2,2M 5% |
| 3253 | 3198 021 31060 | 10M 5% |
| 3254 | 4822 117 12902 | 8,2K 1% 0,063W |
| 3255 | 3198 021 32250 | 2,2M 5% |
| 3256 | 4822 117 12917 | 1R 5% 0,062W |
| 3257 | 4822 117 12917 | 1R 5% 0,062W |
| 3258 | 4822 117 12925 | 47K 1% 0,063W |
| 3259 | 4822 117 12706 | 10K 1% 0,063W |
| 3260 | 4822 051 30123 | 12K 5% 0,062W |
| 3261 | 4822 051 30109 | 10R 5% 0,062W |
| 3262 | 4822 117 13632 | 100K 1% 0,62W |
| 3263 | 4822 117 12902 | 8,2K 1% 0,063W |
| 3264 | 4822 051 30684 | 680K 5% 0,062W |
| 3265 | 4822 051 30223 | 22K 5% 0,062W |
| 3266 | 4822 051 30334 | 330K 5% 0,062W |
| 3267 | 4822 117 12706 | 10K 1% 0,063W |
| 3268 | 4822 051 30153 | 15K 5% 0,062W |
| 3269 | 4822 051 30221 | 220R 5% 0,062W |
| 3270 | 4822 051 30272 | 2,7K 5% 0,062W |
| 3271 | 4822 117 12889 | 270K 1% 0,063W |
| 3272 | 3198 021 32250 | 2,2M 5% |
| 3273 | 4822 117 13632 | 100K 1% 0,62W |
| 3274 | 4822 051 30474 | 470K 5% 0,062W |
| 3275 | 4822 051 30474 | 470K 5% 0,062W |
| 3276 | 4822 117 12902 | 8,2K 1% 0,063W |
| 3277 | 4822 051 30154 | 150K 5% 0,062W |
| 3278 | 4822 051 30103 | 10K 5% 0,062W |
| 3279 | 4822 051 30154 | 150K 5% 0,062W |

### - RESISTORS -

| | | |
|---|---|---|
| 3280 | 4822 117 12891 | 220K 1% |
| 3282 | 4822 051 30103 | 10K 5% 0,062W |
| 3283 | 4822 051 30474 | 470K 5% 0,062W |
| 3284 | 3198 021 32250 | 2,2M 5% |
| 3285 | 4822 116 30467 | 10K 5% |
| 3286 | 2120 358 90509 | 100K H H03ADC |
| 3287 | 2120 358 90509 | 100K H H03ADC |
| 3288 | 4822 051 30223 | 22K 5% 0,062W |
| 3289 | 4822 051 30334 | 330K 5% 0,062W |
| 3290 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3291 | 4822 051 30124 | 120K 5% 0,062W |
| 3292 | 4822 117 13632 | 100K 1% 0,62W |
| 3293 | 4822 051 30332 | 3,3K 5% 0,062W |
| 3294 | 4822 051 30123 | 12K 5% 0,062W |
| 3295 | 4822 051 30332 | 3,3K 5% 0,062W |
| 3297 | 4822 117 12925 | 47K 1% 0,063W |
| 3298 | 4822 117 13632 | 100K 1% 0,62W |
| 3299 | 4822 051 30103 | 10K 5% 0,062W |
| 3300 | 4822 051 30474 | 470K 5% 0,062W |
| 3301 | 4822 117 13632 | 100K 1% 0,62W |
| 3302 | 4822 051 30474 | 470K 5% 0,062W |
| 3303 | 4822 051 30103 | 10K 5% 0,062W |
| 3304 | 4822 117 13632 | 100K 1% 0,62W |
| 3306 | 4822 117 13632 | 100K 1% 0,62W |
| 3307 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3308 | 4822 117 12971 | 15R 5% |
| 3309 | 4822 051 30123 | 12K 5% 0,062W |
| 3310 | 4822 051 30563 | 56K 5% 0,062W |
| 3312 | 4822 051 30331 | 330R 5% 0,062W |
| 3313 | 4822 051 30682 | 6,8K 5% 0,062W |
| 3315 | 2322 702 60184 | 180K 5% |
| 3316 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3317 | 4822 117 12139 | 22R 5% 0,062W |
| 3318 | 4822 051 30331 | 330R 5% 0,062W |
| 3324 | 4822 051 30474 | 470K 5% 0,062W |
| 3330 | 4822 117 13632 | 100K 1% 0,62W |
| 3335 | 4822 051 30183 | 18K 5% 0,062W |
| 3336 | 4822 117 13632 | 100K 1% 0,62W |
| 3337 | 4822 051 30474 | 470K 5% 0,062W |
| 3341 | 4822 051 30102 | 1K 5% 0,062W |
| 3344 | 4822 051 30103 | 10K 5% 0,062W |
| 3345 | 4822 117 13632 | 100K 1% 0,62W |
| 3349 | 4822 051 30331 | 330R 5% 0,062W |
| 3350 | 4822 117 13632 | 100K 1% 0,62W |
| 3351 | 4822 117 13632 | 100K 1% 0,62W |
| 3352 | 4822 051 30682 | 6,8K 5% 0,062W |
| 3353 | 4822 117 12139 | 22R 5% 0,062W |
| 3354 | 4822 051 30102 | 1K 5% 0,062W |
| 3355 | 4822 117 12925 | 47K 1% 0,063W |
| 3356 | 4822 051 30472 | 4,7K 5% 0,062W |

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## ELECTRICAL PARTSLIST - COMBI BOARD

### - RESISTORS -

| | | |
|---|---|---|
| 3357 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3358 | 4822 117 12971 | 15R 5% |
| 3359 | 4822 051 30123 | 12K 5% 0,062W |
| 3360 | 4822 051 30563 | 56K 5% 0,062W |
| 3361 | 4822 051 30331 | 330R 5% 0,062W |
| 3362 | 2322 702 60184 | 180K 5% |
| 3363 | 4822 051 30682 | 6,8K 5% 0,062W |
| 3364 | 4822 051 30109 | 10R 5% 0,062W |
| 3365 | 4822 117 13632 | 100K 1% 0,62W |
| 3366 | 4822 117 13632 | 100K 1% 0,62W |
| 3367 | 4822 117 13632 | 100K 1% 0,62W |
| 3368 | 4822 051 30332 | 3,3K 5% 0,062W |
| 3369 | 4822 051 30332 | 3,3K 5% 0,062W |
| 3370 | 4822 051 30109 | 10R 5% 0,062W |
| 3371 | 4822 051 30109 | 10R 5% 0,062W |
| 3400 | 4822 051 30109 | 10R 5% 0,062W |
| 3401 | 4822 051 30109 | 10R 5% 0,062W |
| 3402 | 4822 117 13632 | 100K 1% 0,62W |
| 3403 | 4822 051 30103 | 10K 5% 0,062W |
| 3404 | 4822 117 13632 | 100K 1% 0,62W |
| 3405 | 4822 117 13632 | 100K 1% 0,62W |
| 3406 | 4822 117 13632 | 100K 1% 0,62W |
| 3407 | 4822 117 13632 | 100K 1% 0,62W |
| 3408 | 4822 051 30103 | 10K 5% 0,062W |
| 3409 | 4822 117 13632 | 100K 1% 0,62W |
| 3411 | 4822 051 30101 | 100R 5% 0,062W |
| 3412 | 4822 117 13632 | 100K 1% 0,62W |
| 3413 | 4822 117 13632 | 100K 1% 0,62W |
| 3414 | 4822 117 13632 | 100K 1% 0,62W |
| 3415 | 4822 051 30103 | 10K 5% 0,062W |
| 3416 | 4822 051 30103 | 10K 5% 0,062W |
| 3417 | 4822 117 13632 | 100K 1% 0,62W |
| 3418 | 4822 117 13632 | 100K 1% 0,62W |
| 3419 | 4822 117 13632 | 100K 1% 0,62W |
| 3420 | 4822 051 30103 | 10K 5% 0,062W |
| 3421 | 4822 051 30152 | 1,5K 5% 0,062W |
| 3422 | 4822 051 30471 | 470R 5% 0,062W |
| 3423 | 4822 051 30109 | 10R 5% 0,062W |
| 3424 | 4822 051 30008 | 0R JUMPER |
| 3425 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3426 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3427 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3428 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3429 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3430 | 4822 051 30008 | 0R JUMPER |
| 3431 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3432 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3433 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3434 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3435 | 4822 051 30472 | 4,7K 5% 0,062W |

### - RESISTORS -

| | | |
|---|---|---|
| 3436 | 4822 051 30102 | 1K 5% 0,062W |
| 3437 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3438 | 4822 051 30102 | 1K 5% 0,062W |
| 3439 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3440 | 4822 051 30102 | 1K 5% 0,062W |
| 3441 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3442 | 4822 051 30102 | 1K 5% 0,062W |
| 3443 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3444 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3445 | 4822 051 30102 | 1K 5% 0,062W |
| 3446 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3447 | 4822 051 30008 | 0R JUMPER |
| 3448 | 4822 051 30008 | 0R JUMPER |
| 3449 | 4822 051 30008 | 0R JUMPER |
| 3450 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3451 | 4822 051 30101 | 100R 5% 0,062W |
| 3452 | 4822 117 13632 | 100K 1% 0,62W |
| 3453 | 4822 117 13632 | 100K 1% 0,62W |
| 3454 | 4822 117 13632 | 100K 1% 0,62W |
| 3455 | 4822 117 13632 | 100K 1% 0,62W |
| 3456 | 4822 117 13632 | 100K 1% 0,62W |
| 3457 | 5322 117 13052 | 2,7K 1% 0,063W |
| 3458 | 4822 117 13632 | 100K 1% 0,62W |
| 3459 | 4822 117 13632 | 100K 1% 0,62W |
| 3460 | 4822 117 13632 | 100K 1% 0,62W |
| 3461 | 4822 117 13632 | 100K 1% 0,62W |
| 3462 | 4822 117 13632 | 100K 1% 0,62W |
| 3463 | 4822 117 13632 | 100K 1% 0,62W |
| 3464 | 4822 051 30103 | 10K 5% 0,062W |
| 3468 | 4822 117 13632 | 100K 1% 0,62W |
| 3469 | 4822 051 30103 | 10K 5% 0,062W |
| 3470 | 4822 051 30103 | 10K 5% 0,062W |
| 3471 | 4822 051 30103 | 10K 5% 0,062W |
| 3472 | 4822 051 30103 | 10K 5% 0,062W |
| 3477 | 4822 117 12971 | 15R 5% |
| 3478 | 4822 117 12971 | 15R 5% |
| 3481 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3501 | 4822 051 30103 | 10K 5% 0,062W |
| 3800 | 4822 051 30008 | 0R JUMPER |
| 3801 | 4822 051 30008 | 0R JUMPER |
| 3802 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3803 | 4822 051 30008 | 0R JUMPER |
| 3804 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3805 | 4822 051 30008 | 0R JUMPER |
| 3806 | 4822 051 30472 | 4,7K 5% 0,062W |
| 3807 | 4822 051 30008 | 0R JUMPER |
| 3808 | 4822 051 30008 | 0R JUMPER |
| 3809 | 4822 051 30008 | 0R JUMPER |
| 3810 | 4822 051 30109 | 10R 5% 0,062W |
| 3812 | 4822 051 30472 | 4,7K 5% 0,062W |

## ELECTRICAL PARTSLIST - COMBI BOARD

### - RESISTORS -

| | | |
|---|---|---|
| 3813 | 4822 051 30008 | 0R JUMPER |
| 3813 | 4822 051 30109 | 10R 5% 0,062W |
| 3815 | 4822 051 30105 | 1M 5% 0,062W |
| 3818 | 4822 051 30103 | 10K 5% 0,062W |
| 3819 | 4822 051 30103 | 10K 5% 0,062W |
| 3820 | 4822 051 30103 | 10K 5% 0,062W |
| 3823 | 4822 117 12917 | 1R 5% 0,062W |
| 3824 | 4822 117 13525 | 24K 1% 0,62W |
| 3825 | 4822 117 13632 | 100K 1% 0,62W |
| 3826 | 4822 051 30105 | 1M 5% 0,062W |
| 3827 | 4822 117 13608 | 4,7R 5% 0,0016W |
| 3828 | 4822 051 30475 | 4,7M 5% 0,062W |
| 3829 | 4822 051 30334 | 330K 5% 0,062W |
| 3830 | 4822 117 13632 | 100K 1% 0,62W |
| 3831 | 4822 117 13632 | 100K 1% 0,62W |
| 3890 | 4822 051 30008 | 0R JUMPER |
| 4201 | 4822 051 30008 | 0R JUMPER |
| 4203 | 4822 051 30008 | 0R JUMPER |
| 4204 | 4822 051 30008 | 0R JUMPER |
| 4205 | 4822 051 30008 | 0R JUMPER |
| 4206 | 4822 051 30008 | 0R JUMPER |
| 4207 | 4822 051 30008 | 0R JUMPER |
| 4208 | 4822 051 30008 | 0R JUMPER |
| 4209 | 4822 051 30008 | 0R JUMPER |
| 4210 | 4822 051 30008 | 0R JUMPER |
| 4211 | 4822 051 30008 | 0R JUMPER |
| 4402 | 4822 051 30008 | 0R JUMPER |
| 4801 | 4822 051 30008 | 0R JUMPER |

### - COILS & FILTERS -

| | | |
|---|---|---|
| 1801 | 2422 540 98428 | FILTER CERAMIC |
| 5200 | 2422 535 94134 | IND FXD SM 10µH 20% |
| 5201 | 2422 535 94134 | IND FXD SM 10µH 20% |
| 5202 | 2422 549 43062 | IND FXD SM EMI 100MHZ |
| 5203 | 2422 549 43062 | IND FXD SM EMI 100MHZ |
| 5204 | 2422 549 43062 | IND FXD SM EMI 100MHZ |
| 5205 | 2422 549 43062 | IND FXD SM EMI 100MHZ |
| 5206 | 2422 549 43062 | IND FXD SM EMI 100MHZ |
| 5207 | 2422 549 43062 | IND FXD SM EMI 100MHZ |
| 5208 | 2422 549 43062 | IND FXD SM EMI 100MHZ |
| 5301 | 3198 018 35670 | FXDIND SM 0,56µH 10% |
| 5302 | 3198 018 35670 | FXDIND SM 0,56µH 10% |
| 5303 | 3198 018 35670 | FXDIND SM 0,56µH 10% |
| 5304 | 3198 018 35670 | FXDIND SM 0,56µH 10% |
| 5305 | 2422 549 43062 | IND FXD SM EMI 100MHZ |
| 5400 | 2422 549 43062 | IND FXD SM EMI 100MHZ |
| 5401 | 2422 549 43062 | IND FXD SM EMI 100MHZ |
| 5402 | 2422 549 43062 | IND FXD SM EMI 100MHZ |

### - DIODES -

| | | |
|---|---|---|
| 6201 | 9322 185 88685 | DIO EC SM SL03 |
| 6202 | 9322 185 88685 | DIO EC SM SL03 |
| 6203 | 4822 130 80622 | BAT54 |
| 6204 | 4822 130 11551 | UDZS10B |
| 6205 | 9322 185 88685 | DIO EC SM SL03 |
| 6206 | 4822 130 80622 | BAT54 |
| 6207 | 9322 185 88685 | DIO EC SM SL03 |
| 6208 | 4822 130 80622 | BAT54 |
| 6209 | 4822 130 11564 | UDZ3,9B |
| 6210 | 4822 130 82594 | BAT54C |
| 6211 | 4822 130 11564 | UDZ3,9B |
| 6212 | 4822 130 11564 | UDZ3,9B |
| 6213 | 4822 130 11564 | UDZ3,9B |
| 6214 | 4822 130 11564 | UDZ3,9B |
| 6215 | 4822 130 80622 | BAT54 |
| 6216 | 4822 130 82594 | BAT54C |
| 6217 | 4822 130 80622 | BAT54 |
| 6218 | 4822 130 80622 | BAT54 |
| 6219 | 4822 130 80622 | BAT54 |
| 6300 | 5322 130 34331 | BAV70 |
| 6301 | 4822 130 11397 | BAS316 |
| 6302 | 4822 130 11551 | UDZS10B |
| 6401 | 4822 130 11564 | UDZ3,9B |
| 6402 | 4822 130 11564 | UDZ3,9B |
| 6800 | 5322 130 10734 | BAT54A |

### - IC & TRANSISTORS -

| | | |
|---|---|---|
| 6200 | 9322 116 74668 | LD1117D33 |
| 7200 | 5322 130 60845 | BC807-25 |
| 7202 | 9351 624 90118 | 74LV132D |
| 7203 | 9352 701 07118 | TEA1208T/N1 |
| 7204 | 9322 179 08685 | SI2305DS |
| 7205 | 3198 010 42310 | BC847BW |
| 7206 | 3198 010 42310 | BC847BW |
| 7207 | 5322 130 60845 | BC807-25 |
| 7208 | 9322 179 08685 | SI2305DS |
| 7209 | 3198 010 42320 | BC857BW |
| 7210 | 3198 010 42320 | BC857BW |
| 7211 | 3198 010 42310 | BC847BW |
| 7213 | 5322 130 61569 | BC868 |
| 7214 | 5322 209 82941 | LM358D |
| 7215 | 3198 010 42320 | BC857BW |
| 7216 | 3198 010 42310 | BC847BW |
| 7217 | 9322 171 12671 | SC111259AFTA |
| 7218 | 3198 010 42310 | BC847BW |
| 7222 | 3198 010 42310 | BC847BW |

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ELECTRICAL PARTSLIST - COMBI BOARD

### - IC & TRANSISTORS -

| | | |
|---|---|---|
| 7227 | 3198 010 42310 | BC847BW |
| 7229 | 3198 010 42310 | BC847BW |
| 7230 | 9352 701 07118 | TEA1208T/N1 |
| 7232 | 3198 010 42310 | BC847BW |
| 7234 | 3198 010 42310 | BC847BW |
| 7235 | 3198 010 42310 | BC847BW |
| 7236 | 4822 130 42804 | BC817-25 |
| 7237 | 3198 010 42310 | BC847BW |
| 7238 | 3198 010 42320 | BC857BW |
| 7238 | 9322 179 08685 | SI2305DS |
| 7300 | 9340 219 40135 | BC817-40W |
| 7301 | 3198 010 42320 | BC857BW |
| 7302 | 9340 219 40135 | BC817-40W |
| 7303 | 4822 209 33165 | TDA1308T/N1 |
| 7304 | 4822 130 42615 | BC817-40 |
| 7305 | 9340 219 40135 | BC817-40W |
| 7306 | 5322 130 60845 | BC807-25 |
| 7307 | 3198 010 42310 | BC847BW |
| 7308 | 3198 010 42320 | BC857BW |
| 7309 | 3198 010 42310 | BC847BW |
| 7310 | 4822 130 42615 | BC817-40 |
| 7311 | 9340 219 40135 | BC817-40W |
| 7313 | 3198 010 42310 | BC847BW |
| 7401 | 3198 010 42320 | BC857BW |
| 7402 | 9352 731 32557 | SAA7752EL/N102 |
| 7403 | 9322 145 26668 | M24C02-WMN6 |
| 7404 | 9322 166 67668 | MT48LC4M16A2TG-7E |
| 7405 | 3198 010 42310 | BC847BW |
| 7802 | 5322 130 60845 | BC807-25 |
| 7803 | 9965 000 16922 | SAA7824HL |

**Note: Only these parts mentioned in the list are normal service parts.**